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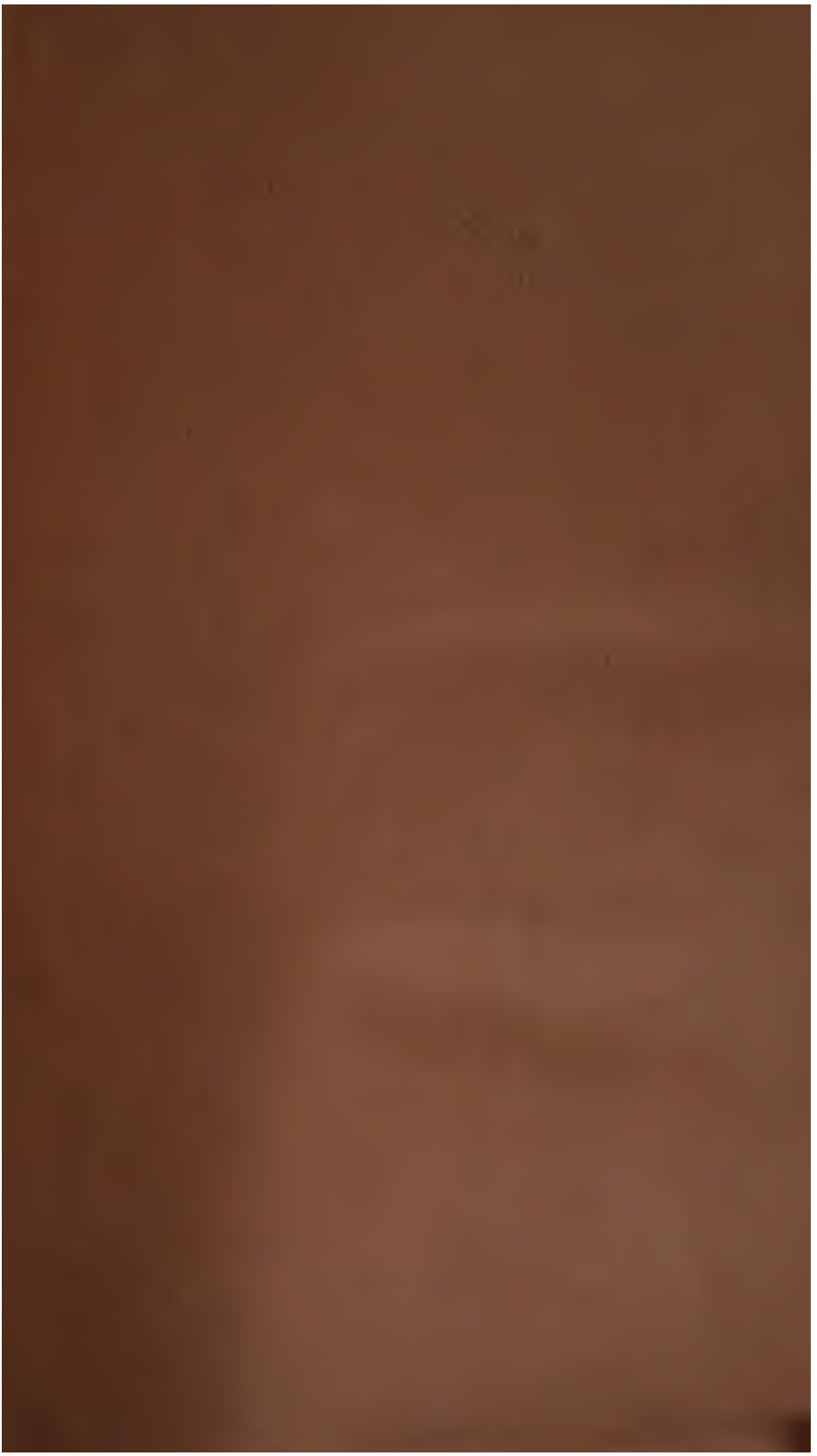
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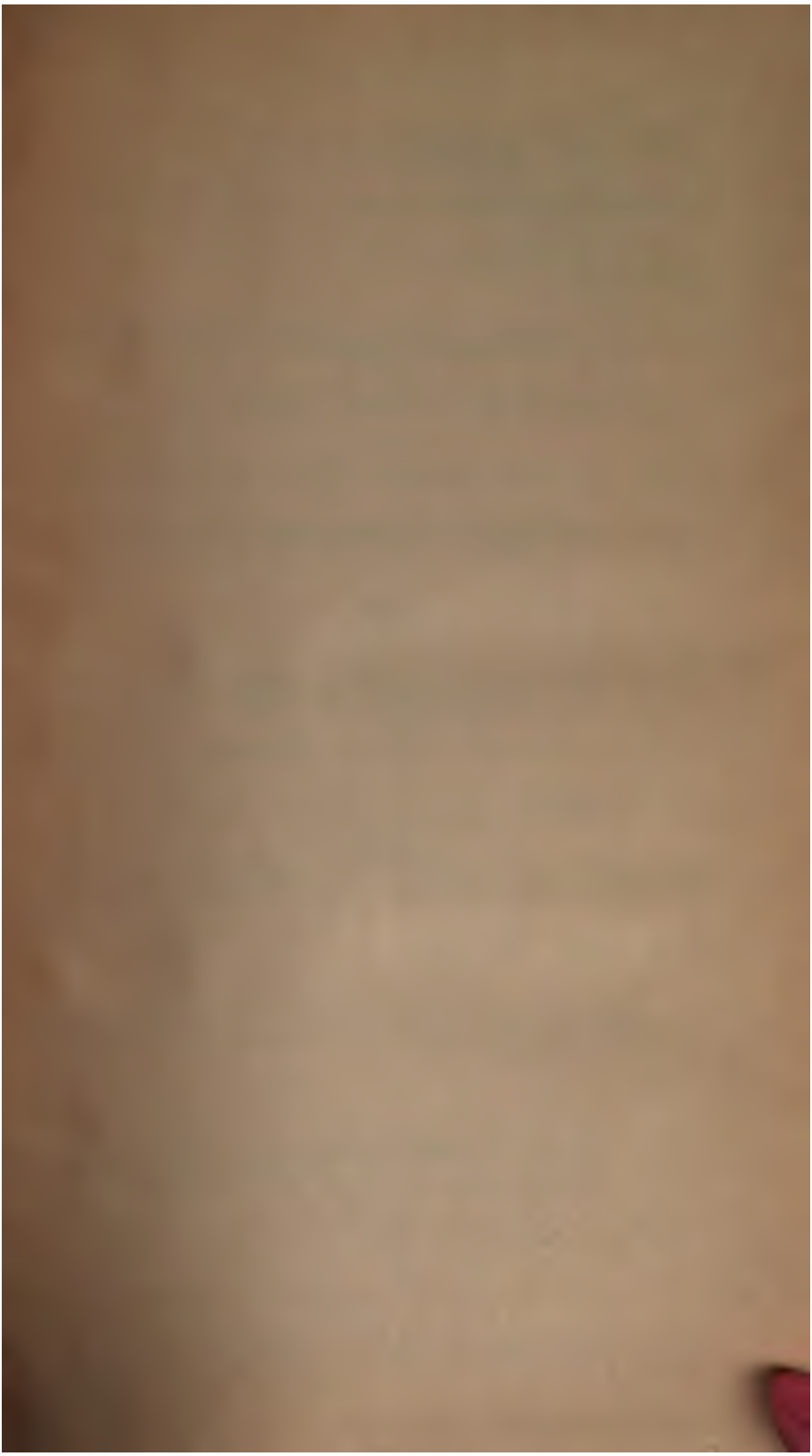
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REPORTS

OF

THE ENGINEERS

OF THE

WESTERN RAIL ROAD CORPORATION,

MADE TO

THE DIRECTORS,

IN

1836-7.

SPRINGFIELD:
PRINTED BY MERRIAM, WOOD AND CO.

1838.

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REPORT

UPON THE

SURVEYS BETWEEN WORCESTER AND SEVEN MILE RIVER IN BROOKFIELD.

Worcester, Aug. 15th, 1836.

TO THE PRESIDENT AND DIRECTORS OF THE WESTERN RAIL ROAD CORPORATION.

GENTLEMEN,

In submitting for your consideration a Report upon the surveys which have been made during the present season, for a route for the Western Rail-Road, from Worcester to the valley of the Chickopee River, it may be well to premise the description of the several lines which have been examined, by a few remarks upon those features of the intermediate country, which must influence, in a great degree, the character of any, or all the routes, which connect these two points.

The waters of the Blackstone, upon which the village of Worcester is situated, are separated from those of the Chickopee, by a tract of country, elevated from 450 to 650 feet above the level of the Boston and Worcester Rail-Road at Worcester; presenting, consequently, a summit, between the tributaries of these streams, of the height just named, to be overcome by the Rail-Road.

The numerous branches which rise in this high ground, flow principally from the north to the south, and by their course indicate the general declivity of the country, as well as the direction of the ridges which lie between, or divide the waters. These ridges are of an uniform character; that is to say, they are generally broken by a succession of numerous spurs, and intervening hollows, or ravines. In many places, the spurs or ridges are composed of gravel, intermixed with stone of moderate size; and, not unfrequently, they are formed of entire rock, either Mica-slate, or Gneiss.

Our route being from east to west, or transverse to the general course of the streams and ridges, no line of any extent in that direction, either level, or of a given inclination to the horizon, can be maintained, without resorting, either to a succession of cuttings and fillings, or a constant series of curves. Keeping the difficulties in view in both cases, and avoiding either extreme, we endeavor to adopt a medium, as near as may be, depending in each instance upon the particular locality.

The declivity of the country, on both sides of the summit, in the proper direction for the route, being too great to attempt to cross directly from one valley to the other, without the intervention of inclined planes, we are compelled to deviate from the true course, and conform in a great degree to the direction of the ridges, and to attain the required elevation, by giving to the line such an inclination as may be considered admissible, viz. one which shall be fully within that upon which a locomotive engine may work effectively. Such a line cannot, of necessity, as has been before remarked, be direct in its course; it must in this be governed by the form of the ground. The general character of this portion of the line being understood, we proceed in our attempt to find the best practicable route, across from Worcester to the Chickopee.

The main ridge being sufficiently well defined, as a preliminary step, a line of levels was traced in 1835, along the same, from Charlton to Paxton, about 15 miles, in a direction nearly north, to ascertain the principal depressions. These, as is usually the case in similar situations, were found at those points near which tributaries of different streams have their sources. By this profile, Charlton Meeting-house is about 455 feet above the Worcester Rail-Road, and Paxton Meeting-house about 655 feet above the same point. From this statement it is evident that, so far as the height of the summit is concerned, we must look to the south for the least elevated ground.

The most southern of the depressions, selected for the passage of a route, is near James Ryan's, in the northern part of the town of Charlton, and about three miles north of Charlton centre Meeting-house. It lies between a branch of the French River, and a branch of the Quinebaug, and is elevated 452.41 feet above the Boston and Worcester

Rail-Road, and by the route surveyed, 13.82 miles from it. An uniform grade between the two points would give 32.77 feet per mile. By referring to the accompanying Table, (marked No. 1,) it will be seen how the grades have been established, to conform best with the ground traversed by the line.

In passing north from Ryan's summit, the next depression we have attempted is at Morey's summit, also between the waters of the French River, and those of the Quinebaug, and in the town of Charlton, but near the Spencer line. It is elevated 492.76 feet above the Boston and Worcester Rail-Road, and is 13.31 miles distant from it. An uniform grade to this summit would give 35.51 feet per mile.

Grout's summit, in the town of Spencer, is the third. It lies about 2½ miles south of the village, and between the head of a branch of Cranberry Meadow Brook (a branch of the Chickopee,) and the French River. It is 445.75 feet above the Boston and Worcester Rail-Road; and by the valley of the French River, 13.42 miles distant, the uniform grade would be 32.21 feet per mile. Still further north, beyond the line of levels traced along the summit, and in the town of Rutland, there are two depressions, which were determined in 1835, by running a line from Worcester, to the Ware River, in Barre. One is at Bartlett's, 585 feet above the Boston and Worcester Rail-Road; and the other at Gates's, 608 above the same.

Of these summits, it will be seen by referring to the Map, that Grout's is more nearly in the general direction of the route to Springfield, than either of the others; Morey's next; then Ryan's; and that Bartlett's and Gates's are farthest from it. We will now proceed to the particular description of each route, taking Route No. 1, by Ryan's summit, as a base to which the others may be referred, in the comparisons.

Route No. 1, by Ryan's summit, represented on the general Map by a full red line, and on the sheet of Profiles, marked No. 1.

Commencing at a point about 600 feet east of the freight depot of the Boston and Worcester Rail-Road, the line passes south of J. Goddard's house, thence crossing the Blackstone canal, it passes south of G. Trumbull's, and sweeping

around the foot of Powder-house knoll, upon a curve of 2300 feet radius, it passes over the Springfield road, crossing it south of Braman's house, and thence north of Jacques's house, and barn, it falls upon the point of Goat hill; turning this hill at its northern extremity, with a radius of 2300 feet, upon a curve of 1800 feet in length, it pursues thence a straight line 2.5 miles, through the valley of Beaver Brook, across Tatnick Brook, and west of the village of New-Worcester; thence crossing the Springfield road, and the Hartford turnpike, it curves across the valley of Kettle Brook (or Blackstone River) and falls upon the side hill, near the upper part of Parkhurst's mill-pond. Following this side hill at a grade of 38 feet, the line passes into the town of Ward, and thence conforming to the general direction of the ridge (about south-west) it crosses, at Knowles's mills, a small branch of Kettle Brook, thence, pursuing the course of the side hill, it is thrown out of its proper direction, by a spur of high ground, called Henshaw ridge, which protrudes itself in a south-easterly direction; thence turning nearly west, and winding round this spur, which here forms the dividing ridge between the Blackstone and French Rivers, near L. Stone's house, the line passes into the north-east corner of Oxford North Gore; thence, lowering the grade to 35 feet per mile, and turning gradually to the north-west, to cross the valley of French River, it passes this stream a little below the Clappville lower factory, at which point it enters the south-east part of the town of Leicester; and then running south of the Church in this village, reverts to a south-westerly course, (re-entering Oxford North Gore) and continuing this direction to Station 499, towards Ryan's summit.

To diminish the quantity of filling at the French River upon this line, a second line was carried farther up the valley on the north-east side of the stream, crossing it midway of the factory pond, and, passing north of the Church, it pursues a south-westerly direction, and intersects the first route about one mile south-west of Clappville, the details of which will be found in the Table.

Resuming the first route at Station 499, the line continues to ascend to the summit, at an uniform grade of 35 feet per mile. Before reaching it, however, it is twice thrown out of its proper course—first at Captain Tucker's hill, and

again at the creek, which passes by Charlton North side, into French River. A straight line from Captain Tucker's, to the summit, would pass near the Church at Charlton north side, but to cross the creek above referred to, with an embankment, even of 50 feet, the line must pass at least three fourths of a mile north of the church. In the experimental line, which was surveyed in 1835, in a course more direct from Tucker's hill, to the summit, and passing near the Church referred to, the stream was found to be 60 feet lower than it is at the first crossing place, or something like 100 feet below the grade line of 35 feet. The profile of this line (Map No. 14,) will convey a just idea of the nature of the ground south of our line.

A line was also attempted in 1835, passing north of Captain Tucker's hill, and nearly in a direct course from Clappville towards Morey's summit. But the ground north and west of Captain Tucker's was found to be too high, and the line was abandoned, about half a mile north of said Tucker's house.

As has been stated above, the line, from Clappville to the summit, was traced at an uniform grade of 35 feet to a mile. This involves a cutting of 32.5 feet at the summit, and deep cutting for 2900 feet in length, and this will exceed 27 feet in depth, for a distance of 2500 feet. This excessive cutting suggests the alternative of raising the grade upon both sides of the summit. Accordingly, upon the east side, the grade upon 7200 feet has been raised from 35.01 to 38.88; and on the west side, from 35.29 to 38.57 for a distance of 16,360 feet. As the ground falls off in the direction of the line upon both sides of the deep cut, the effect of raising the grades will evidently be to increase the height of the embankments. The accompanying Tables will exhibit fully, the computations of the quantity of earth to be removed in both cases.

Through the cut from 723 to 756, there are two curves of 1000 feet each; the first of 1041 feet radius, the second of 1432 feet. This combination of steep grade, and the curve of least radius which occurs upon the route, appears here, to be in a great measure unavoidable.

At Ryan's summit, as in most similar situations, where streams flowing in opposite directions rise near each other, there is a swamp. This swamp is traversed by the route

about 250 feet. A pole was thrust down 12 feet without reaching the hard bottom.

At Ryan's house, which is on the summit, there is a well about 15 feet—no rock was encountered in digging it. On the southern margin of the ravine and near the route, in digging a well of 18 feet, rock was discovered. The probability is, that in going beyond 20 feet cutting, we should meet rock.

Turning from the summit, at Station 730, down, the line winds around from west to north, upon a curve of 1432 feet radius, and descending at a grade of 35.29, it crosses a branch of the Quinebaug River, flowing south; thence it falls upon the side hill, which, upon the east, bounds the valley of Cranberry Meadow Brook (a branch of the Chickopee River;) thence entering the town of Spencer, it pursues the side hill nearly north, to Watson's Brook, about 5 miles; thence turning gradually to the north-west, it crosses the Springfield road and the Seven mile River; thence turning to the south-west, it crosses the Springfield road a second time near the Spencer and Brookfield line, and terminates at Station 1132 in the road from Brookfield to Sturbridge, about half way between Gallup's mills, and the Furnace village, or East Brookfield; and by the route surveyed 21.43 miles from Station 1, at Worcester.

Route No. 2.

From No. 1 of the first route, a line was also surveyed across Racoon Plain, passing south of Powder-house hill, the Manual Labor School, and New Worcester, and intersecting the first route at Station 198. This line is 900 feet shorter than the first line. But in ascending from Racoon Plain to 198, the grade is 54 feet; and the grading would be expensive.

Route No. 2, and 1, were also connected by a line from Station 60, south of the Manual Labor School, passing on the south slope of Goat hill to No. 147 of No. 1, at the sand knoll west of New Worcester Village, near the direction taken by Mr. Baldwin, in his south route, from Worcester to the Bottomly factory. This line crossed the Springfield road near S. S. Gates's, at a point about 34 feet above the Boston and Worcester Rail-Road, or 12 feet

above our present grade line at 147. Two curves would be thus introduced—one to the north, to turn into the small ravine from No. 2—and the other south, to fall into No. 1.

It may not be amiss in this place to say, that a less circuitous and better line can be found still farther south, pursuing a branch of Kettle Brook, called Dark Brook; but it lies too low for our route. At the southern bend of Kettle Brook, nearly 4 miles from Worcester, this stream is elevated 10 feet only above the Boston and Worcester Rail-Road; and as we require a distance of nearly 13 miles to pass the summit at a grade of 35 feet, even, it is obvious that the line by Dark Brook would not suit our purpose, unless it might be deemed expedient to resort to fixed engines and inclined planes, to overcome the summit; in which case a route by this valley would be favorable, and a considerable portion of the whole rise might probably be concentrated at the point of Henshaw's ridge, before spoken of. This route is entitled to more notice, if taken in connexion with the Grout summit route, than it would be with that by Ryan's summit.

From Station 897 in Spencer, to 1132 in Brookfield, a line was surveyed crossing the Cranberry Meadow Brook above the red school house in Spencer, and thence pursuing the hill-side west of the Brook, it falls into the first line at 1132, as stated.

This line (marked No. 6,) is shorter than the first, by nearly one mile, and consequently descends at a steeper grade; viz. for 2.01 miles, at 50.17 per mile, and for 1.43 miles, at 34.74. The crossing of the Cranberry Meadow valley would necessitate a heavy embankment; that is to say, the present grade line is about 60 feet above it, and the width from the high ground on one side of the stream to that on the other, is 1000 feet. The accompanying Table will exhibit the amount of cutting and filling on this line, in comparison with that between the same portion of the first line. It is probable that a line located from the summit in this direction at an uniform grade of 43 or 44 feet, would present a more favorable profile, even than the present one, which was traced for a grade corresponding more nearly with that of Route No. 1.

At the crossing of the Seven-mile River by the first route, the grade is 50 feet above the stream, and the immediate

valley is 1400 feet wide. Another line was traced (Route No. 7,) crossing about 1000 feet farther south, or below, with the view of saving embankment. The grade line crosses 30 feet above, only, but the valley is 2000 feet wide. The Table will exhibit the relative amount of embankment upon these two routes.

The Routes from Clappville to Grout's summit.

The main line from Clappville to Grout's summit, is made up of portions of two distinct lines, carried upon different sides of the French River—the lower, or eastern portion being a part of Route No. 8—and the upper, or western portion, a part of No. 9. In selecting the best line for the route, it will be necessary to cross and re-cross the stream several times, as will be seen in the annexed description of each route.

In the case of Route No. 9, by the south-west side of the river, a considerable portion of the heaviest part of the embankment at the cove of the upper mill-pond, near the village, can be avoided by throwing the whole line farther south; an alternative which would *increase* the amount of cutting, but equalize, more nearly, the quantity of excavation and embankment.

From Grout's summit west, the descent to the valley of the Chickopee can be effected by two different routes—one nearly south—and the other north. To understand why we make so great a deflection from the proper course of the road, a few words of explanation are necessary.

Cranberry Meadow Brook, (referred to in the description of Route No. 1,) at a point less than one mile west of Grout's summit, is 240 feet below it. The declivity in that direction being so great, any line descending at an admissible grade for locomotive engines, must turn either to the north or south. To effect the descent within the prescribed limits, and to ascertain the direction in which it could best be made, two lines were traced—one south, by the head of Cranberry Meadow pond—and the other north, through the village of Spencer and across the Seven-mile River, one and a half miles north of the Meeting-house. The particular description of each will exhibit the details. viz.—

Route No. 8.

Leaving Route No. 1 at 448, near Clappville, a line was carried upon the north-east side of French River, crossing the Hartford turnpike east of the upper factory pond, thence across to the Baptist Meeting-house on the road from Charlton to Leicester village, thence by a straight line through the middle of Wall's mill-pond, 1400 feet, thence crossing the river to the south-west side, at the north end of Grass hill, near Sibley Converse's, and curving around to the west, it again crosses the river (or brook, as it is here,) and passing into the town of Spencer, it crosses, from 615 to 626, a swamp or meadow 1100 feet long, and varying in depth from 2 to 8 feet; thence turning the point of W. Watson's hill at Jones's mill, it continues on the north side of the brook to Watson's saw-mill, thence crossing the brook, it winds around south of west upon a very gradual curve, and pursuing a small branch of the main brook, it crosses another meadow and swamp of 200 feet in extent, of the same character as that at 615, and reaches the summit near J. Grout's house, having attained an elevation of 445.75 feet above the Boston and Worcester Rail Road at Worcester. (The Bench Mark at this summit is a point designated in Mr. Baldwin's survey of 1828.)

Route No. 9.

This is a line traced on the south-west side of French River. Leaving Route No. 1 at 462, it passes through the village of Clappville, crossing the turnpike near the tavern, thence passing over a cove of the upper mill pond upon a heavy embankment, it continues along the side hill near the road from Clappville to Leicester village, crossing the Charlton and Leicester road at Wall's mills; turning the point of a spur at this place, it continues nearly straight across a small cove of Wall's large pond or reservoir, thence falling upon the slope of Jones's hill, it unites with Route No. 8 near Sibley Converse's, and is thence identified with that route to Grout's summit.

A line in continuation of Route No. 9 from the point of intersection with No. 8, was carried around the north part

of Watson's hill, by V. Jones's, and in a direction towards Kingsley's, crossing the northern extremity of the meadow of 2000 feet in extent, referred to in Route No. 8, thence along on the side hill, and crossing the main branch of the brook, it unites with Routes No. 8 and 9, at Grout's summit. This line is 3600 feet longer than the corresponding portion of the other, with an increase of curvature, and without any improvement in the grades.

Two wells at Grout's, about 18 feet in depth, gave no indication of rock; but towards the western side of the summit it shows itself in ledges. The swamp at the summit is inconsiderable in extent, with large loose rock scattered over it.

From the summit at Station 745 (Route No. 8, towards Cranberry Meadow Pond,) the line winds around upon a curve, varying from 1432 to 2865 feet radius, and descending at a grade of 35 feet, thence it pursues its course south, on the same side hill which Route No. 1, from Ryan's summit, follows in its course to the north, thence it passes into the town of Charlton, near Newhall's mills, thence continuing still further south, about half a mile, it makes an entire semicircle, turning from the south to the north, and upon a shorter radius than occurs in any other line, viz. 716 feet, and this short turn cannot well be avoided; for an increase in the length of the radius of curvature would throw the line into very deep cutting, on the west side of the pond; continuing its course north, the route crosses Cranberry Meadow Pond, and again enters the town of Spencer, following the side hill west of Cranberry Meadow Brook, and thence by a deep cut across a neck of land, which, to be turned, would require a very short radius; and thence, to avoid a similar turn beyond, it crosses the brook twice, near the red school house, thence winding around, gradually, over broken ground, and passing several small runs, it enters the town of Brookfield, and unites with Route No. 1, at Station 1132, between Gallup's mill and Furnace Village, or East Brookfield. The distance from Worcester by this route, is 21.83 miles.

Route No. 10, *by Grout summit and Spencer Village.*

From the summit at 745, this line pursues a direction nearly west, half a mile, thence winds to the north upon

curves of 1273 and 1910 feet radius, descending at a grade of 30.95 feet, for 2.74 miles, to Spencer lower village; thence it continues north, on the side hill, at a grade of 55.42, for 1.57 miles; thence at 39.95; all which is detailed in the Table. At the distance of about one and a half miles north of Spencer village, it curves to the west and south, on a radius of 1900 feet, and crosses the two branches of Seven mile River; and thence by the western side hill of Seven mile River valley, with occasional moderate curves, it falls into Route No. 1, at 1065 of the same—distance 22.04 miles.

Route No. 11,—*Morey Summit Route.*

This route branches from Route No. 1, at Station 558, near Capt. Tucker's hill, on the east side of the summit; thence passing over broken ground by widow Tucker's, at a grade of 34.28; thence increasing the grade to 57 feet, the line crosses, near Chamberlain's, the road from Charlton to Spencer, and thence to the summit. This summit is elevated 472.76 feet above the Boston and Worcester Rail-Road. Upon this grade, the cutting there, for 500 feet in length, would exceed 20 feet—the greatest is at Station 699, and would be 42 feet, and it would be equal to 40 feet for 300 feet in length. In descending west, the line was connected with No. 1 farther south than it should have been; the consequence is, that the grade of the road, (72.93,) upon this portion of the line, is much steeper than it would be if the two lines were connected farther north. The details are contained in the Table. A route leaving this line at Station 645, near the Charlton and Spencer road, passing north of Jones's mill, and intersecting the first route at 710, upwards of a mile west of 645, was attempted. The embankment upon this line is less than upon the first; but to obtain a grade of 45 feet it will require cutting greater than 25 feet (and at the summit 40 feet) for 2700 feet. A line diverging from the first route at 680, and intersecting it at 714, was also attempted, but without success. Still another route, further south, was attempted; it leaves the first route at about Station 600, passes through the burying ground south of Chamberlain's house, and unites with the

main line east of the summit. The filling upon this line would be excessive—at one point 90 feet.

Route No. 12, *by Henshaw Ridge.*

A line was surveyed in 1835, for a route, from Worcester towards Grout's summit, passing north of the other lines. Its direction was as follows. Taking our Route No. 1 to Jacques's farm, instead of turning the point of Goat hill to the south-west, it passed over north-west to Newton's hill, crossing in its route Turkey, or Mother, Brook; thence over a part of Newton's hill, it crossed Beaver Brook below Newton's saw-mill; thence turning the point of some elevated ground near C. Hardwin's, it crossed a small branch of Beaver Brook; thence curving around south-west, it crossed Tatnick Brook, one third of a mile below, or south of, Patch's saw-mill; thence winding around by P. Gates's, it fell into the meadow north of Jones's tavern, on the Springfield road, and passing through the point of the main ridge, west of Jones's, it pursued the valley of Kettle Brook, on its north side, near the Springfield road, to Bottomly's factory; and thence by Watson's Pond to Henshaw ridge, (the same that Route No. 1 *turns*, at its southern extremity, near Clappville;) crossing this ridge, it terminated in the meadow at the north end of Henshaw Pond. The total distance run over was 6.74 miles, or about one mile greater than Mr. Baldwin's, between the same points. The height of the ridge is 355 feet above the Boston and Worcester Rail-Road, giving, if an uniform grade could be adopted, 52.67 per mile. But as this cannot be effected, a desire was expressed by some gentlemen interested in the Rail-Road, to ascertain what would be the advantage to the route, by passing the valley of Tatnick Brook farther north, and, instead of crossing it below Patch's saw-mill, to ascend the stream about half a mile, by which it would be passed nearer to the grade line by 40 feet, than at the first crossing place. For this particular purpose, this might answer. But the great difficulty in this route is in rising from the meadow or swamp, north of Jones's, to Henshaw ridge; the fall in the stream itself being too great. If by crossing Tatnick Brook farther north, we gain sufficient elevation, even, to fall upon higher

ground in the valley of Kettle Brook, it would oblige us, necessarily, to make a very crooked line. Doing the best we can with this line, that is, throwing out 40 feet of the embankment at Tatnick Brook, the rise from the swamp behind Jones's to the Bench at Watson's Pond would be 100 feet; and the distance 1¼ miles, or a grade of 77.64 per mile. From the ridge to the summit at Grout's, 5.35 miles, the ascent can, apparently, be easily accomplished.

The table of inclination, and cutting and filling, upon this route, extends to Henshaw ridge only—as far as the survey of 1835 was carried.

A route was also surveyed, leaving No. 1, at Station 644, near Chamberlain's in Charlton, and thence by Jones's mill, Otis Green's, and James Green's, to the summit of the ridge near D. Hobbs's, in Spencer, and thence by an inclined plane to Route No. 6, near the red school house.

The summit, by this route, is elevated 488 feet, and will require a grade of about 80 feet per mile, to attain it from the east. The descent is about 200 feet to Cranberry Meadow Brook, and the length of the plane about 3000 feet.

This line is 1.15 miles shorter than that by Morey summit, and 2.04 miles shorter than the Ryan line.

There are three routes by which the road may enter the village of Worcester. The first is by the line described in Route No. 1. The second is by leaving Route No. 1, at Station 141, and crossing the Springfield road, north of New Worcester, thence passing over to Route No. 2, at Station 60 of the same, thence by it to the Boston and Worcester Rail-Road, east of the freight depot. The third line is by the valley of Turkey Brook, and the north end of the village.

The computations have been made upon all the lines for a width of 26 feet—slopes at the excavations and embankments of 1½ to 1. In estimating the quantity of rock cutting, we have been governed by appearances only. Whenever it appeared in ledges at the surface, it is estimated in the table as "rock;" when in boulders, or not in place, it is denominated "loose rock." It is quite probable that we may encounter a greater amount of rock in the cuts than we have estimated for; and to provide for this contingency,

we have fixed such prices for the cutting as will, most probably, cover this item.

The estimate is to be regarded rather as comparative. The probable cost of the several parts of the line have been computed in detail; and as far as our suppositions as to the amount of rock are correct, so far may the estimate be taken as correct. But, as has been remarked, a greater amount of rock may be found in the deep cuts than we have anticipated. The truth is to be developed by boring only.

MAPS AND PLANS.

No. 1 is a rough, general map, upon a large scale, of the country between Worcester and Brookfield, exhibiting all the lines which have been surveyed across the summit, including Mr. Baldwin's, Mr. Fessenden's, and our own.

No. 2. Is a map containing the lines which have been approximately located during the present season—lines upon which the computations of the quantity of cutting and filling have been made.

No. 3. Contains profiles of all the principal lines of this season, together with that of the line by Tatnick Brook, and Henshaw ridge, surveyed in 1835 by Mr. Fessenden.

Nos. 4, 5, 6, 7, 8, 9, and 10 inclusive, are Topographical plans of the New Worcester route; Grout summit routes; the Morey summit, and the Cranberry Meadow Pond routes.

No. 11. Contains the Ryan line, on an enlarged scale, both in plan and profile, with the cross sections of the same, exhibiting the slope of the ground transversely to the route, at each station.

No. 12. Contains the profiles of various parts of lines, being modifications of the Ryan summit route.

No. 13. Spencer village line.

No. 14. Is the profile of a line surveyed in 1835, from the south part of Henshaw ridge, passing near Charlton North side to Ryan summit, by a more direct route than our line. It will serve to give a correct idea of any route between Worcester and Ryan summit, by any approximation to a *straight* line.

Nos. 15, 16, 17, 18, 19, and 20. Topographical maps of

the Ryan summit route, made by Mr. Stebbins in 1835. They exhibit a minute and accurate delineation of the ground traversed by our present route. There not having been sufficient time to complete those of this season for this report, these are submitted with this remark, that we shall have nothing better to present hereafter. They will convey a true idea of the nature of the ground which any route across the summit between the Blackstone and Chickopee must traverse.

No. 21. Profile of route No. 12, by Tatnick Brook to Henshaw ridge.

TABLES.

No. 1. Is a table containing a synopsis of the routes numbered from 1 to 12. It exhibits the length, ascents, descents, grade, excavations, embankments, bridges, culverts, and grubbing; the estimated cost of grading and bridging, for a surface width of 26 feet, upon each route, so footed, that the comparative cost and advantages of the several routes are presented. The heights and distances are all referred to the level of the Boston and Worcester Rail Road at the "Hathaway farm" in Worcester.

No. 2. Is a table of the curves upon each route, exhibiting the length of the radius, and of the curve itself, for each portion of the line in which it occurs. It also presents the aggregate length of curves of the same radius in each route.

The surveys have been executed by Assistants Stebbins and Potter, who have with untiring industry, most zealously and satisfactorily performed their several duties. Mr. Anderson has acquitted himself with his usual skill, for which he is conspicuous, in the numerous drawings illustrative of the surveys; and indeed, it is our good fortune to testify to the persevering efforts of all employed under us, to aid in the fulfilment of the duties which devolve on us.

The foregoing descriptive memoir will have sufficiently defined the localities which characterize the various modifications of the several routes, all of which, coincident as

they are, from their commencement at Worcester (with the exception of No. 12, which crosses the Henshaw ridge,) pass through the depression below Clappville, of the same ridge which divides the waters of the Blackstone and French Rivers. Thence but two general routes, in fact, present themselves, by which to effect the passage of the main dividing ridge, which separates the waters of the Chickopee from those of the French River; for the route by Morey's summit is a mere modification of that by Ryan's, suggested by the desire to avoid the deflection southward through the depression at Ryan's. It may also be added, that for the sake of comparison, we shall suppose these several routes to reunite at the red school-house in Spencer, on Cranberry Meadow Brook, and thence pursue the route indicated on the map as No. 6, to the valley of the Chickopee River; for it is obvious, whether in point of directness or cost, this route is preferable to those more north of it. We proceed, then, to the following concise illustration of such parts of the routes competing for our preference, as are involved in their comparison.

Grout Summit Route.

The objection to this route may be said to exist rather in the descent from its summit in the main dividing ridge, than in the ascent to it; for although the grade of the Rail-Road in its approach to the summit has been projected on an inclination conforming to the fall in the valley of the French River of 57 feet per mile for 1.7 miles, it is believed that this may without inconvenience, be reduced to a less exceptionable grade.

But the difficulties on the western slope are not so readily obviated; for the descent from the summit to Cranberry Meadow Brook (a tributary to the waters of the Chickopee River,) is so abrupt, that a fall of 240 feet is to be overcome in less than one mile, by an inclined plane with stationary power; or the alternative must be resorted to of distributing this descent in a circuit of upwards of 5 miles in distance, over a surface requiring rocky and expensive excavations. Nevertheless, for our present purpose, (that of comparison with the routes by either the Morey or Ryan summit,) we shall assume the alternative alluded to. The

elevation of the natural surface at the Grout summit is, as has been stated, 445.7 feet, reducible, probably, not more than 15 feet by excavation, because of the length of the cut, and the probable existence of rock at a greater depth. The length of the route from the point of departure near Worcester, to the vicinity of Gallup's mills (on the Chickopee,) is 21.9 miles, and the estimated cost of graduating the road-bed through that distance, $602,292.

It is believed, however, that a more correct comparative view will have been presented, should we assume the quantity of rock excavation to exceed that estimated, and we shall, in preference to a less sum, suppose the total cost to be about $635,000.

Route via Morey and Ryan Summit.

The elevation of the dividing ridge, in its passage at either of these depressions, reducible by practicable cuts, will be found to be the same as that of the Grout summit, to wit, 430 feet; and the distance by either will therefore be computed by the actual length of each, which by the Morey summit is found to be 19.56 miles; and by the Ryan summit 20.4 miles—computing, as has been stated, from the red school-house, by Route No. 6, to Gallup's mills.

The passage by the Ryan summit is to be effected (see Tables) by grades in no case exceeding 40 feet per mile; while by the Morey summit (the total elevation, and therefore the aggregate resistance from gravity being the same in both cases) we must resort to an inclination (consequent on the diminished distance, within which the elevation or descent is to be overcome) of 45 or 50 feet. The total cost of graduation will be, by the Ryan summit route, say, $653,000; and for the Morey summit $586,487. Or, the comparative characteristics of the three prominent routes, which we have attempted thus briefly to review, may be summarily thus exhibited:—to wit,

Rout.	Length.	Height of summit. Feet.	Grade.	Cost.
By Grout summit,	21.90	430	57	$635,000
" Morey "	19.56	"	50	586,000
" Ryan "	20.40	"	40	653,000

In other respects, these routes cannot be said to differ materially; and as in both length and cost, that by Morey's summit has the advantage, and even in its maximum grades, at equal cost, it might be nearly assimilated to those required in the passage of Ryan's summit, we respectfully recommend it to your preference.

It now remains to us, however, to revert to the mode suggested of effecting the descent westward from the Grout summit, by the substitution of an inclined plane, with stationary power, for the circuit heretofore made between Station 745, at the summit, and 1035 at the red school-house, in Spencer, including a distance of 5.5 miles, the estimated cost of grading which, (a large proportion of rock excavation being necessarily encountered,) amounts to $173,290.

Sufficiently minute surveys have not been made, with reference to this object, (for an inclined plane was not contemplated, until an analysis of the results of the surveys, within a day or two past, suggested its possible expediency,) but from the data in our possession, it would seem probable, that the cost of graduating this portion might be reduced in the sum of nearly, or quite, $150,000, and at the same time diminish the distance, as heretofore remarked, 4¼ miles.

The cost of graduating the road-bed, therefore, on the Grout summit route, (the descent to the Cranberry Meadow Brook being effected by an inclined plane) would then be but $525,000, and the distance but 17.65 miles; resulting in a cost of $61,000 less than that required by the Morey summit route, and a reduction in distance of 2¼ miles; which advantages (diminished cost and distance) with that of concentrating so large a portion of the ascent from the western base to the summit of the dividing ridge, certainly would seem to claim for the route our most serious deliberation; and if, in further and more minute surveys, it shall be found practicable, within a reasonable expenditure, so to distribute the fall from the summit to Cranberry Meadow Brook, over a plane whose inclination shall permit the effective use of locomotive engines, no adequate reason occurs to us to oppose its recommendation to your preference. If, however, on the other hand, a resort to fixed, or stationary engines shall appear (as it does at present) irremediable for the whole descent, without excessive excavation on the summit, on the hypothesis that the diminished cost assumed is to be made in so short a distance that the inclination of the

plane would be in the ratio of 1 to 9—say 587 feet per mile, then sufficient considerations, resulting from the annual cost of maintaining the stationary engines, with the delay and risk of accidents on so steep an acclivity, would, in our opinion, outweigh those which we have assumed may belong to the route, and we should still feel it our duty to recommend to your adoption the Morey summit route.

In our present uncertainty, therefore, resulting from the want of adequate data to guide us with certainty to a correct conclusion, we should suggest that a decision on this most important question be, for the present, postponed ; and that such farther surveys be forthwith instituted as shall suffice to dispel all doubt.

These surveys, it is supposed, may not only be made, but the line prepared for contract, so that proposals may be invited for the graduation of the Rail-Road, and its actual construction begun, on or before the 15th October. The location may also simultaneously progress beyond Gallup's mills. So that, at any rate, during the current year, 1836, the construction of the Rail-Road throughout the entire distance between Worcester and Springfield shall have been begun.

It may be well to add, that a route, not heretofore alluded to, since our present investigations began, has been surveyed, diverging from 644 of Route No. 1, and passing the Hobbs summit in a direct route across the ridge, to the red school-house; the distance by which from Worcester to Gallup's mills, would be 18.7 miles; but the approach to the summit would be difficult, and the descent from it so abrupt, as to require stationary power.

The elevation of the summit, moreover, after reducing it by a cut of 20 feet in depth, (as deep as would be expedient) would be 468 feet, or 30 feet higher than either of the other summits, which when equated, will be found to result, virtually, in an increased distance beyond that of the Morey summit route.

The Board is aware that experimental surveys are now being made beyond the town of Springfield, the results of which will be duly communicated.

Respectfully submitted,

WM. GIBBS McNEILL, CHIEF ENGINEER.

W. H. SWIFT, RESIDENT ENGINEER.

SYNOPSIS OF ROUTES.

Station.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Desc. of Grade Feet.	Total Descent.	Elev. of Grade above B. & W. R. R	Elev. of surf. of ground ab. B. & W. R. R	Grade	Excavation. Earth.	Excavation. Rock	Excavation. Loose R.	Embankment.	Bridges. Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.	
	No 1. Ryan Summit Route.										**From Station 1, at the Boston and Worcester R. Road at the Hathaway Farm, to Station 1132, via Clapp ville, Ryan Summit, and East side Cranberry Meadow Brook.**									
1.																			B. & W.R. R. 600 ft. E. of Fr. Dep.
53.	5300	1.004	1.004	10.	10.			10.	37.74	9.96	23,675.8	739.5		29343 2	50	230	0000	12394	70 Jaques's hill.
147.	9400	1.780	2.784	12.	22.			22.	22.58	6.74	53,642.3	2965 1		85822.5	75	20+	1.4000	2955-	60 Sand-hill west of New-Worcester.
198.	5100	0.966	3.750	38.	60.			60.	85.01	38.55	80,207.8	4638.6		83845.6		478	0000	28744	70 Junction with Route No. 2.
316.8	11880	2.250	6.000	86.	146.			146.	144.37	38.55	198,990.7	21238.9	18864.4	47592.9	20	790	7000	93095	80 Near Knowles's mills.
448.	13120	2.485	8.485	85.	231.			231.01	232.56	35.01	215680.5		7018.6	152550.7	40	974	3300	62481	10 Com. of R. 3, 8 & 10, near Clapp.
462.	1400	0.265	8.750	11.3	242.3			242.03	234.49	35.01				71502.4	125	238	0000	26351	50 do. of No. 9, near Clappville.
499.	3700	0.701	9.451	25.7	268.			268.	284.19	35.01	26609.1	15333.3	660.1	39423.7		208	600	30020	20 Junction with Route 3.
558.	5900	1.118	10.569	37.94	305.94			305.94	338.41	35 01	34157.7	2082.2		33326.4		394	1000	12372	00 Com. of Route No. 11.
662.	10400	1.970	12.538	68.56	374.5			374.05	375.82	35.01	178437.9	24000.0	12881.1	293865.9		1374	1300	108606	60 do. of Route 4.
730.	6800	1.288	13.826	45.50	420.			420.	452.41	35.01	151434.0		7088.3	50004.4		302	1800	46365	20 Summit.
734.	400	0.076	13.902						435.38	35.29	37466.6					000	000	9366	50
790.	5600	1.060	14.962			40.09	40.09	379.90	385.55	35 29	138947.8			73639.9		314	1600	43206	00 Junction with Route No. 11.
809.	1900	0.360	15.322			12.90	53.	367.	384.07	35 29	57546.9					000	600	14466	70 Com. of Route No. 5.
883.	7400	1.402	16.724			49.	102.	318.	311.08	35.29	104518.3	12462.9		23432.0		346	3300	45545	70 End of do. do.
897.6	1460	0.276	17.000			10.01	114.01	307.99	299.64	35.29				31261.0		1300	000	7815	20 Com. of Route No. 6.
1014.	116.40	2.205	19.205			88.99	201.	219.	233.36	39.83	159798 5	5000.0	14374.3	120560.2		000	800	60173	20 Com. of Route No. 7.
1054.	4000	0.758	19.963			29.	230.	190.	218.42	39.83	59452.6			225895.0	20	975	900	66085	70 Near the crossing of S. M. River.
1065.	1100	0.208	20.171			5.	235.	185.	197.19	22.63	29144.3		867.8			000	900	7908	80 End of Route No. 7.
1072	700	0.132	20.303			2.78	237.78	182.22	174.97	22 63	3651.8			48592.2		60	400	1384	70 Junction with Route No. 10.
1117.	4500	0.852	21.155			19.28	257.06	162.94	162.16	22.63	26472.7			50791.1		498	000	13793	70 Road at Gallup's mills.
1132.	1500	0.284	21.439			5.	262.06	157.94	162.43	17.60	11239.8			3228 1		060	000	3016	00 Sturbridge Road 1500 ft. west of
											1591175.1	88260.5	61754.6	1420944.2	330	1087	27900	722746	60 Gallup's mills in Brookfield.
	No. 2. Ryan Summit Route.										**From Station 1, of Route No. 1, to Station 198 of same, passing east of New Worcester village.**								
1.											1433549.2	80117.3	61754.6	1222932.9	125	7773	23.500	652048	60 B. & W. R. R. 600 ft. E. of Fr. De.
130.	13000	2.462	2.462	7.5	7.5			7.5	2.	3.04	72129.0		3526.2	168463.8	130	814		50854	40 Kettle Brook.
189 or 198.	5900	1.117	3.579	52.5	60.			60.	85.01	53.71	119033.3		5010.	92596.4	70	308	2.700	38322	70 Unites with Route No. 1,
1132.		17.689	21.552																By Route No. 1.
											1624761.5	80117.3	70290.8	1482998.1	325	8895	46.200	741225	60

SYNOPOSIS OF ROUTES.—(*Continued.*)

Station.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Descent of Grade. Feet.	Total Descent.	Elev. of Grade above B. & W R R.	Elev. of surf. of ground ab. B & W R R	Grade.	Excavation. Earth.	Excavation. Rock.	Excavation. L. Rock.	Embankment.	Bridges. Feet.	Culverts. Perches	Grubbing. Feet.	Amount.		
No. 3. *Ryan Summit Route.*											**From Station 448 to a point near 400 of same, Crossing French River, north of 1st Route.**									
448			8.495					231.01	232.56		572297.1	29382.1	25383.0	399154 9	18	26 8	14700	226274	90	Near Clappville.
505																				
or 499	5700	1.079	9.564	36.99	36.99			268.	284.19	34.28	38850.8			77797.5		150	700	27766	70	
1132		11.988	21.552								992268.9	43545.1	35211.5	910863.2	20	5563	12600	140101	00	By Route No. 1.
											1603416.8	72927.2	61094.5	1387815.0	20	8291	28000	94141	60	
No. 4. *Ryan Summit Route.*											**From Station 662 of Route No. 1. to Station 897 of same, raising the grade to diminish the cutting.**									
662.			12.538					374.5	375.92		811501 9	70797.6	39424.2	857273.3	310	1892	17600	103625	20	
734.	7200	1.363	13.901	53.	53.			427.5	435.38	38.88	112902.2		1564.1	69746.8		302	1800	33661	60	400 feet west of the summit.
897.6	16360	3.098	17.000			119.51	119.51	307.99	299.64	38.57	190766.4	11120.3		224544.8		1320	5500	80829	20	
1132.		4.439	21.439								289759.7	5000.0	15242.1	405333.6	20	1533	3000	152356	10	By Route No. 1.
											1404930.1	86917.9	56230.4	1536998.5	330	3047	27900	670472	10	
No. 5. Ryan Summit Route.											**From 809 of Route No. 1. to Station 883 of same, passing west of Newhall's Hill.**									
809.			15.322					367.	384.07		1196897.1	70797.6	46512.5	960917.6	310	5508	21600	517029	60	Near Spencer and Charlton line.
887.																				
or 883.	7800	1.477	16.799			49.	49.	318.	311.08	33.17	44378.6	5522.4		126445.8		596	4600	39657	90	Opposite Bemis's Peg Mill.
1132.		4.715	21.514								289759.7	5000.0	15242.1	436594.6	20	2833	3000	160171	30	By Route No. 1.
											1531035.1	81320.0	61754.6	1523958.0	330	8937	29200	716858	40	
No. 6. Ryan Summit Route.											**From Station 897.6 of Route No. 1, to Station 1132 of same, passing on the west side of Cranberry Meadow Brook, and red school-house (in Spencer.)**									
897.6			17 000					301.	299.63		1301415.4	85260.5	46512.5	1015610.6	310	7154	24500	570390	50	Gr. low'rd 699 ft. at 897.6 for this R.
922.	2440	0.462	17.462			23.	23.	278.	267.71	50.17	1441.8			129931.5		960	200	3336	70	Near red school house in Spencer.
1004.	8200	1.553	19.015			78.	101.	200.	194.27	50.17	56940.2			65399.0		386	3550	19565	70	Near N. Bemis's Saw mill Brook.
1080																				
or 1132	7600	1.439	20.454			50.	151.	150.	162.43	34.74	32609.7	5046.8		81945.8	20	190	1800	29916	70	By Route No. 1.
											1392407.1	88307.3	46512.5	1292856.9	330	8690	30450	653239	60	

SYNOPSIS OF ROUTES—*(Continued.)*

Stations.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Desc. of Grade Feet.	Total Descent.	Elev. of Grade above B. & W R. R.	Elev. of surf. of ground ab. B.& W.R.R	Grade	Excavation. Earth.	Excavation. Rock.	Excavation. L. Rock.	Embankment.	Bridges. Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.	
No. 7. Ryan Summit Route,											**From Station 1014 of Route No. 1, to Station 1065 of same, crossing Seven Mile River, at a point about 1000 feet south of Route No. 1.**								
1014			19.205					219	233.36		1461213.9	88260.5	60886.8	1136170.8	310	7154	25700	630563 70	
1060.5 or 1065	4650	0.881	20.086			34	34	185	197.19	38.59	59553.9			163959.1	40	975	1400	49169 70	
1132.		1.266	21.352								41364.3			38878.4	20	558	400	18188 40	By Route No. 1.
											1562132.1	88260.5	60886.8	1359008.3	370	8687	27500	697921 80	
No. 8. Grout Summit Route.											From Sta. 448 of R. No. 1, to Sta. 1132 of same, via Clappville, N. E. side of French River to Grass Hill, thence on South side of French River, and South of Watson's Hill to Grout's Summit, thence by South end of Cranberry Meadow Pond, and West side of Cranberry Meadow Brook, to Sta. 1132, as above.								*Note.* In Routes 8, 9, & 10, 17,250 yds. of rock to be added to the quantity contained in the table.
448.			8.485					231.01	232.56		572297.1	29382.1	25883.0	399154.9	185	2678	14700	226274 90	Near Clappville, N. E side of F. R.
562.	1400	2.159	10.664	65.	65.			300.	299 41	30.10	74364.1		11917.6	184365.5	70	1318	2400	60227 50	Head of Wall's Reservoir (nearly.)
609.	4700	0 889	11.533	50.53	115.53			350.53	345.50	56.77	166441.1		9905.3	5885.8	30	82	2800	48967 10	Near N. end of G. hill S. Convers's.
655.	4600	0.872	12.405	49.46	165.			400.	407.25	56.78	6804.3		1844.	54952.1	10	184	00	16151 40	Near Watson's saw mill.
709 or 745.	5400	1.023	13.428	30.	195.			430.	445.75	29.33	27697.4	6614.7	1433.2	37428.8		490	300	18152 50	Grout's summit.
910.	16500	3.125	16.553			110	110	320.	316.	35.20	73600.0	48000.0		93542.7	10	371	4300	87574 00	Near road from Charlton to Brook.
989.	7900	1.496	18.046			35	145	285.	291.51	23.39	63488.9		4766.2	58733.4	40	266	1900	21501 80	In road from Spencer to Brookfield.
1035.	4600	0.871	18.920			41	186	244.	266.99	47.14	221459.7		6678.3	39188.1	10	82	1400	64215 80	Red School House in Spencer.
1073.	3800	0.720	19 640			34	220	210.	210.62	47.14	52333.			45410.3	10	00	2700	16973 20	West of Howe's Mills.
1124.	5100	0.966	20.606			40	260	170.	168.57	41.41	68990.5			92968.2		616	2900	25836 00	Opposite N. Bemis's saw mill.
1192 or 1132.	6800	1.288	21.894			17	277	153.	162.43	13.20	39730.8		1474.5	53064.6	100	456	1400	17188 10	Sturbridge road to Brookfield.
											367206.8	83996.8	65902.1	1084694.4	465	6543	34800	802292 50	
No. 9. Grout Summit Route.											From Station 462 of Route No. 1, to Station 609 of Route No. 8, via Clappville and W. side of French River.								See note at No. 8.
462.			8.750					242.3	234.49		572297.1	29382.1	25883.0	470657.3	185	2916	14700	252626 40	Near Clapp. S. W. side of F. River.
515.	5300	1.004	9.754	32.70	32.70			275.	268.33	32.57	14183.3		2364.1	146093.9		660	400	39870 30	Road from Clappville to Leicester.
607 or 609.	9200	1.742	11.496	77.	109.70			352.	345.50	44.20	103354.7		20670 8	79748.7	15	550	1300	42202 90	Near N. end G. hill 609 of R. No. 8.
1132.		10.361	21.857						162.43		554104.6	54614.7	16196.2	475288.2	210	2465	14900	266822 80	609 to 1132 by Route No. 8.
											1243939.7	83996.8	65114.1	1171788.1	410	6591	31300	601523 00	

SYNOPSIS OF ROUTES—(*Continued.*)

Stations.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Descent of Grade Feet.	Total Descent.	Elev. of Grade above B. & W. R. R.	Elev. of surf. of ground ab. B. & W. R. R.	Grade.	Excavation. Earth.	Excavation. Rock.	Excavation. L. Rock.	Embankment.	Bridges Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.	
No. 10. Grout Summit Route.											From Sta. 448 of R. No. 1. to Sta. 1132 of same, via Grout's Sum., Spencer, L. Village, & Prouty's mills.								See note at No. 8.
448.											572297.1	29382.1	25883.0	399154.9	185	2678		226274 90	Near Clapp. N. E. side of F. River.
745.		4.943	13.428					430.	445.75		275306.9	6614.7	25100.1	282632.2	110	2074		143498 50	448 to 745 by Route No. 8.
890.	14500	2.746	16.174			85.	85.	345.	346 70	30.95	2816.4	67274.2	25989.8	265285.7		1414	3050	154929 40	Spencer village.
973.	8300	1.572	17.746			87.	172.	258.	257.05	55.42	214331.3	4268.5	23143.0	194318.1	22	234	1900	77476 90	Near Turkey Hill Brook.
1010.	3700	0.701	18.447			28.	200.	230.	193.60	39.95	76548.2			113496.0		58	000	28590 00	Near Browning Brook.
1069.	5900	1.117	19.564			4.	204.	226.	227.42	3.58	50579.8		10521.9	125163.2	12		350	40065 10	
1109.	4000	0.758	20.322			6.	210.	220.	228.82	7.92	22415.1	11385.8		23986.3		356	000	22586 40	In Road near Moses Hall's.
1140.																			
or1072	3100	0.587	20.909			37.78	247.78	182.22	174.97	64.35	4596.5		8849.0	1066.2		186	000	7730 40	
1117.	4500	0.582	21.761			19.28	267.	162.94	162.17	22.63	26472.7			50791.1		498	000	13793 70	
1132.	1500	0.284	22.045			5.	272.	157.94	162.43	17.60	11239.8			3228.1			000	3010 00	Sturbridge road to Brookfield.
											1256603.8	118925.3	119486.8	1459121.8	339	7498	20000	717953 00	
No. 11. Morey Summit Route.											From Station 558 of Route No. 1. to Station 790 of same, across Morey's Summit.								
558.			10.568					305.94	338.41		633063.9	46797.6	26543.1	543407.4	310	3518	16300	295018 60	Near Capt. Tucker's hill, (S. end.)
622.	6400	1.212	11.780	41.56	41.56			347.50	348.	34.28	62154.3		5650.3	92883.6	10	372	400	31492 20	Near widow Tucker's.
703.	8100	1.534	13.314	37.50	129.06			435.	443.38	57.03	145409.0	22138.0		267327.0	20	538	1000	100185 00	500 ft west of the summit. The summit is at 699 and is 472.76 ft.
743. or 790.	4000	0.757	14.071			55.10	55.10	379.9	385.55	72.73	18221.8	637.8		22707.9		418	000	9214 60	Unites with Route No. 1.
1132.		6.477	20.548					157.94	162.43		451824.9	17462.9	15242.1	460026.6	20	3179	6900	220183 70	By Route No. 1.
											1310673.9	87036.3	47435.5	1386352.5	360	8025	24600	555984 10	
No. 12. Grout Summit Route.											A line from Station 1 to Henshaw meadow, north of Henshaw pond, in Leicester, from the experimental line surveyed in 1835, thence to Grout's summit.								
1.	5300	1.004	1.004	10.	10.			10.	37.74	9.90	23675.8	739.5		29343.2					Boston and Worcester Rail Road.
53.	12200	2.310	3.314	80.	90.			90.	60.06	34.81	223149.0			167240.0					Jaques's farm.
175.	6200	1.178	4.492	60.	150.			150.	150.28	50.93	25685.0			222245 0					Valley of Tatnick Brook.
237.	6800	1.288	5.780	100.	250.			250.	258.42	77.64	251868.0			4670.0					Swamp north of Jones's Tavern.
305.	5070	0.960	6.740	81.	331.			331.	316.83	84.35	28188.0			80709.0					Factory pond.
355.7		5.350	12.090						445.75								2600		Henshaw meadow.
No. 745 of R. 6											582565.8	739.5		504107.2					From 355.7 to Grout's Summit by Mr. Baldwin's surv. 5.350 miles.

TABLE. EXHIBITING THE RADIUS OF CURVATURE, AND AGGREGATE LENGTH OF CURVES IN EACH ROUTE.

From Sta.	To Sta.	Radius Ft.	Cur. Ft.
No. 1, Ryan Sum. Route.			
1	5	1146	500
26	31	2292	500
61	80	"	1800
151	156	5730	500
210	220	1432.5	1000
240	247	"	700
323	329	1910	600
333	335	"	200
340	345	"	500
361	390	2865	2900
390	396	1273.5	600
397	408	"	1100
415	436	1432.5	2100
446	456	"	1000
468	487	"	1900
537	566	2865	2900
586	591	"	500
609	613	"	400
623	629	1910	600
659	677	3820	1800
698	712	1432.5	1400
712	722	1041.8	1000
746	756	1432.5	1000
770	773	2865	300
790	801	1432.5	1100
806	812	"	600
823	827	2865	400
842	845	"	300
860	869	1432.5	900
872	876	1910	400
886	890	1432.5	400
893	896	2865	300
903	**910**	**1432.5**	**700**
918	**922**	"	**400**
923	**931**	"	**800**

From	To.	Rad.	Cur.
931	933	1910	200
938	942	1432.5	400
949	962	"	1500
981	987	2865	600
1003	1009	2292	600
1029	1053	"	2400
1064	1075	1432.5	1100
1091	1098	"	700
1107	1110	1637	300
1119	1122	"	300
1137	1141	1432.5	400
No. 2, Ryan Sum. Route.			
15	25	5730	1000
109	116	2865	700
178	189	1910	1100
No. 3, Ryan Sum. Route			
449	451	1432.5	200
461	465	1146	400
474	484	1273.3	1000
487	494	1432.5	700
No. 5, Ryan Sum. Route.			
809	816	1432.5	700
837	842	"	500
849	857	"	800
883	887	"	400
No. 6. Ryan Sum. Route			
897	906	2865.	900
909	920	"	1100
920	926	5730.	600
926	946	2865.	2000
946	956	1432.5	1000
956	986	1910.	3000
996	1001	"	500
1010	1035	1432.5	1500

From.	To.	Rad.	Cur.
1046	1054	1432.5	800
1057	1060	"	300
No. 7, Ryan Sum. Route.			
1014	1020	1146.	600
1057	1070	"	1300
No. 8, Grout Sum. Route.			
488	506	2865.	1800
598	612	1637.1	1400
626	632	2292.	600
661	668	1432.5	700
680	687	2865.	700
768	771	"	300
771	785	1432.5	1400
830	845	2865.	1500
885	891	"	600
891	899	1432.5	800
899	908	716.2	900
908	918	1432.5	1000
918	922	2865.	400
922	946	5730.	2400
950	960	1432.5	1000
1018	1025	1910.	700
1037	1046	2865.	900
1068	1083	1637.	1500
1110	1117	2865.	700
1143	1149	1432.5	600
1170	1173	"	300
1173	1192	"	1900
No. 9, Grout Sum. Route.			
481	491	2865.	1000
519	528	"	900
563	571	"	800
583	607	1432.5	2400

From.	To.	Rad.	Cur.
No.10, Grout Sum. Route.			
750	771	1910.	1500
771	789	1273.3	1800
794	800	"	600
816	822	1432.5	600
824	837	"	1500
840	845	5730.	500
849	854	"	500
861	863	1637.	200
870	879	1041.8	900
885	894	1432.5	900
920	932	"	1200
942	945	1273.3	300
946	959	1146.	1300
959	964	2865.	500
983	1007	1146.	2400
1021	1027	1910.	600
1027	1032	5730.	500
1032	1035	"	300
1035	1041	1910.	600
1075	1081	"	600
1109	1116	1432.5	700
1126	1135	"	900
No. 11, Morey Sum. R.			
584	591	2865.	700
607	619	"	1200
636	640	"	400
640	656	1910.	1600
656	660	5730.	400
666	677	"	1100
677	690	1432.5	1300
701	708	5730.	700
708	712	1432.5	400
731	742	1146.	1100

Recapitulation.

Rad.	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.
716.2	1041.8	1146	1273.3	1432.5	1637	1910	2292	2865	3820	5730
No. 1, Ryan Summit Route.										
1000		500	1700	18100	600	2500	5300	8600	800	500
No. 2, Ryan Summit Route.										
1000			1700	18100	600	3600	3000		300	800	1000
No. 3, Ryan Summit Route.										
1000		900	2700	16400	600	2500	5300	5200	1800	500
No. 5, Ryan Summit Route.										
1000		500	1700	18900	600	2100	5300	7900	1800	500
No. 6, Ryan Summit Route.										
1000		500	1700	17900	600	5800	2300	11900	1800	1100
No. 7, Ryan Summit Route.										
1000		2400	1700	17.500	600	2500	2900	8600	1800	500
No. 8, Grout Summit Route										
900		500	1700	11.500	2900	2000	2900	9800		2900
No. 9, Grout Summit Route.										
900		500	1700	13900	1800	2000	2900	10700		2900
No. 10, Grout Summit Route.										
		4200	4400	10100	1600	4500	2900	5900		2300
No. 11, Morey Summit Route.										
		1600	1700	18500	600	3500	5300	6800		2700

RECAPITULATION OF TABLE No. 1.

ROUTES.	Elev. of Sum. above B. & W. R. R.	Elev. of Grade of do. above B. & W. R. R.	GRADE. 0 to 10 ft.	10 20	20 30	30 35	35 40	40 45	45 50	50 55	55 60	60 65	65 70	70 75	Total length. Miles.	Total cost of Grading and Bridging.	REMARKS.
No. 1, Ryan Summit Route.	452.41	420.	2.784	0.284	1.192		17.179								21.439	722746 60	
No. 2, Ryan Summit Route.	452.41	420.	2.462	0.284	1.192		16.213			1.117					21.268	741225 60	
No. 3, Ryan Summit Route.	452.41	420.	2.784	0.284	1.192	1.079	16.213								21.553	694141 60	
No. 4, Ryan Summit Route.	452.41	427.5	2.784	0.284	1.192		17.179								21.439	670472 10	
No. 5, Ryan Summit Route.	452.41	420.	2.784	0.284	1.192		17.254								21.514	716858 80	
No. 6, Ryan Summit Route.	452.41	420.	2.784			1.439	14.216			2.015					20.454	653239 60	
No. 7, Ryan Summit Route.	452.41	420.	2.784	0.284	0.984		17.302								21.354	697921 80	
No. 8, Grout Summit Route.	445.75	430.	2.784	1.288	2.519	2.159	8.826	0.996	1.591		1.761				21.894	602292 30	
No. 9, Grout Summit Route.	445.75	430.	2.784	1.288	2.519	1.004	9.091	2.708	1.591		0.872				21.857	601523 00	
No. 10, Grout Summit Route.	445.75	430.	4.659	0.284	1.875	4.905	6.402				3.333	0.587			22.045	717955 00	
No. 11, Morey Summit Route.	472.76	435.	2.784	0.284	1.192	1.212	12.785				1.534			0.757	20.548	655994 10	

REPORT

UPON THE

SURVEYS BETWEEN WORCESTER AND SEVEN MILE RIVER

IN BROOKFIELD, VIA HENSHAW RIDGE, &c.

Worcester, Sept. 30th, 1836.

To the President and Directors of the Western Rail Road Corporation.

Gentlemen,

In obedience to the Resolution of the Board of Directors of the 24th August, directing certain additional surveys to be made, we have the honor to state that the same have been completed, and herewith we submit a Report, together with the necessary Maps, Tables, &c. exhibiting the results.

From Worcester towards Grout's Summit, two routes, in the general direction of Mr. Baldwin's line have been surveyed. The first of these we designate as No. 13, being a continuation of the numbers referred to in the Report of the 15th September. This line diverges from Route No. 1, at Station 62—it crosses from thence to the west side of Beaver Brook Valley, and pursues the hill side, towards Barnard's house; thence across to the ridge west of Jones's tavern; crossing this ridge near Williams's, and Kettle Brook near Wordsworth and Fowler's satinet factory, it falls upon the side hill south of Kettle Brook, and continues its course up that brook by a line nearly straight, to Henshaw ridge, thence turning a little south of west, it crosses Henshaw meadow, and falls upon the main Leicester ridge; pursuing the foot of this ridge, until it turns it at Livermore's, thence it regains a course corresponding more nearly with the proper direction of the route; and crossing the Saddler meadow, and a part of Haven's saw-mill pond, it continues

by Kingsley's and falls into Route No. 8, at Station 602 of the same.

The second of these lines, (Route No. 14,) leaves the Boston and Worcester Rail Road at Station 0, passing south of Powder House Hill, and the Manual Labor School, it crosses the Springfield road, near S. S. Gates's, and thence descends 19 ft. to Tatnick Brook valley; thence pursuing its course west, it crosses the Ryan summit line (Route No. 1,) at the sand hill, near New-Worcester; thence, instead of crossing the ridge north and west of Jones's tavern, it passes in front or south of his house, and turns it; crossing the Bottomly factory stream near Eldridge and Parson's woolen factories, it continues by the south side of the same, to Station 226 of Route No. 13, before referred to, from thence to 602 of Route No. 8, it is the same as Route No. 13. The description of Route No. 8 from Station 602 above mentioned, to Grout's summit, will be found in the report of 15th September.

From Grout's Summit west, towards Brookfield, two lines were carried down in the general direction of Mr. Baldwin's, and three others were attempted in other directions. The best of these has been selected to make the computations upon. It is represented in the accompanying profile, and numbered Route 13. This line passes down from the summit towards Jesse Bemis's, south of whose house it crosses the Spencer road; thence turning a point of the rocky ridge, N. W. of Bemis's, it follows the side hill and descends at a grade of 79.20 to Sylvester Luther's; at this point it is thrown out of its course by the prominent hill north west of Luther's house; thence it passes north of the hill upon which Warren Livermore resides; thence turning to the south west it descends to the valley of Seven Mile River, near to its junction with Cranberry Meadow Brook; from thence at a moderate grade, it follows the general course of the stream, crossing it three times, to avoid unnecessary curves, and terminates near Station 1132 of Route No. 1, in the Sturbridge road, west of Gallup's mill.

No. 15.—*Route by an Inclined Plane from Grout's Summit to the valley of Cranberry Meadow Brook.*

The rocky ridge north west of Jesse Bemis's, referred to

in the description of the last route, prevents, effectually, the passage of a line from Grout's Summit, in the direction of the Seven Mile River; and the only practicable line by which the descent by an inclined plane is to be effected, is by the valley of Livermore Brook; this is a branch of Cranberry Meadow Brook, and flows in a direction about west south west. The course of the latter stream being here nearly north, a great deflection at the foot of the plane is obviously the consequence, viz. something like 120°. Were it not for this circumstance, the plane could be carried quite down to Cranberry Meadow Brook, and by this disposition, the whole descent would be effected. To obviate the difficulty of introducing an abrupt curve at the foot of the plane, it is necessary to begin to deflect before reaching Cranberry Meadow Brook; and at the same time, it is, for a similar reason, also necessary to throw the line upon the side hill west of this brook. The plane itself is straight, 3800 ft. in length, and descends at a grade of 194.50 per mile. At the foot of the plane the curve of 1041 ft. radius commences; thence for a distance of 7300 ft. the grade is about 86 ft. per mile. From thence to Station 1132 of Route No. 1, nearly two miles, the whole descent is but 10 ft. This line unites with Route No. 13 near the junction of Cranberry Meadow Brook, and Seven Mile River.

The accompanying Tables, marked A. and B. will exhibit every detail of these three routes—length, grade, cutting, filling, cost, &c. &c. For the present purpose, it will be sufficient to enumerate here the essential points to be considered in the comparisons which are to be made.

Route.	Length in miles.	Max. Grade. Feet.	Cost.
Morey Summit Route by No. 1, 2, 6, & 11.	19.46	50.00	$568000.00
Route 13, N. of Jones's Tavern, Henshaw Ridge, &c.	15.69	136.12	472412.10
" 14, " "	15.67	111 53	427114.30
" 15, (Inclined Plane) and No. 14 combined.	15.46	194.52	404721.20

Referring to the general table, it will be seen that upon Route No. 14, there is 1.68 miles of this line, on the east side of the summit, which ascends 111.53 per mile, and when we state that the whole length of the line to Brookfield is about the same as Mr. Baldwin's, it may be asked why the grade of 80 ft. had been exceeded in ours, while

in Mr B.'s it did not in any case go beyond it. The answer to this is obvious, viz. the necessity of introducing, upon a line of this great acclivity, the smallest possible number of curves. The resistance produced by the curves on a level road may evidently exceed that which is effected on an inclined plane by gravity; even on a plane elevated 100 ft. to the mile. In comparing these lines, therefore, it is quite as necessary to examine the *plan* as the profile.

On the west side of the summit, by making the line more crooked than it now is, the grade may be kept within 80 ft. In our present line it exceeds that amount. In assuming 80 ft. per mile, the succession of curves (which it is impossible to avoid in the descent west,) will increase the resistance, quite as much, or more, than an increase of 10 ft. in the grade, together, (on both sides of the summit) say equal to an inclination of 100 ft. per mile.

In comparing Routes No. 1 by Morey Summit, and No. 14 by the Bottomly factory and Henshaw ridge, to Grout's summit, we arrive at the following results. No. 14 is 3.81 miles shorter than No. 1, and it will cost to grade it, say $161,000, (or including superstructure) $199,000 less than No. 1. It has, however, 7.72 miles exceeding 80 ft. per mile; while the line by Morey will have no grade exceeding 50 ft., and even at that inclination, it will have but 4.79 miles. No. 14 will have two grades on the east side of the summit descending to the west, of 19 ft. and 25 ft. each,—making together 44 ft. and this being equated at 18 ft. (the slope which requires double the power required on a level road,) results in a virtual increase of nearly 2.5 miles; or in other words, it adds 44 ft. to the height of the summit, and thereby diminishes the difference in the length of these two lines to 1.3 miles.

We shall now exhibit the load of an Engine upon planes of various inclinations, from 0 to 100 ft. per mile.

We will suppose an Engine weighing 10 tons to be capable of propelling a load of 260 tons (tender included) on a level; the load of this Engine upon any inclination will be thus expressed:—

$$L = l - \frac{(E+2)g}{g+f}$$

L = Load on plane in tons.

l = Load on level in tons.
E = Engine in tons.
g = Gravity per ton on plane in lbs.
f = Friction of load per ton in lbs.

From the above formula we deduce the value of L, or the load in tons, with which this Engine is capable of ascending upon planes, varying in inclination, from 0 to 100 ft. per mile—the rails being in the best state, or the adhesion $\frac{1}{6}$.

Level, tons.	ft. 10 t.	ft. 20 t.	ft. 30 t.	ft. 40 t.	ft. 50 t.	ft. 60 t.	ft. 70 t.	ft. 80 t.	ft. 90 t.	ft. 100 t.
260 00	173.58	128 95	101.87	83.60	70 04	60.53	52.83	46 60	41.50	37.25

When the rails are wet, or frosty, the adhesion may be diminished to $\frac{1}{10}$; the load in this case is also diminished in the ratio of $\frac{1}{6}$ to $\frac{1}{10}$; or upon a level, the load would be but 78 tons; on 50 ft. per mile, 16.21 tons; on 100 ft. do. 5.40 tons.

We must now consider the cost of maintaining the additional power necessary to be provided, if the shorter route should be adopted. We may safely assert, that not less than two assistant engines will, at all times, be required —one on each side of the summit. On the Liverpool and Manchester road, at the two planes of $\frac{1}{89}$, and $\frac{1}{96}$, equal to 59 ft. and 55 ft. respectively, the freight trains are assisted by additional engines, placed there for the purpose. On that road they have thirty engines, of this number, 10 are in daily use, an equal number in the shop undergoing repairs, and the balance laid aside, being of the older patterns, and less effective than those now made.

On the Worcester road they have 9 engines, one third of which are at all times in the shop. Hence to have the two additional engines at the summit constantly fit for service, we must be provided with three.

The actual cost of keeping 10 engines in constant order, on the Liverpool and Manchester road, for the year ending 30th of June 1834, exclusive of the expense of running them, was £18,300, or for each, about $8,200.

On the Worcester road the actual cost of repairing and running 6 engines for the year ending 30th June, 1836, was

$30,690, or, including the interest upon the cost of the stock, $34,470; or for each, $5,745.

Cost of 3 engines of a larger size than those generally used, say 10 to 12 tons, at $9,000 - - - - - $27,000
Interest upon the same - - - - - - - - - 1,620

Upon a road of grades of 80 feet and upwards, the wear and tear of the engines would be far greater than upon either the Liverpool and Manchester, or the Worcester, from the necessity of using the brakes so frequently upon the descents; the effect of which, it may be incidentally remarked, is quite as injurious to the road, as to the engines. We shall therefore assume $6,500 as the cost of maintaining the engines in repair, and of running the same, and this is only about three fourths of the cost of the repairs alone, of those of the Liverpool and Manchester road.

Cost of repairing and running 2 - - - $13,000
Interest upon cost of 3 - - - - - 1,620

Total cost of 2 (effective) - - - $14,620

And this is the interest of $243,660, or upon $44,360 more than the cost of the additional 3.81 miles, by the Morey summit route. And while to the Corporation, the cost of transportation would be about the same, the sum received for tolls, on the short line, would be only $\frac{1}{11}$ of that upon the longer line.

It will be seen from what has been said, in relation to these two routes, that notwithstanding the distance gained by that through Grout's, and the consequent diminution of first cost in the construction, the total expenditure for power, on each route, will very nearly equalize the cost of construction and transportation, on each route. And when we take into consideration the practical difficulties of applying power upon steep grades, the maintaining it always with certainty, and the great danger of impairing the confidence of the public, in the safety of this mode of travel, from the greater liability to accident, and the more serious consequences resulting from accidents upon the steeper grades, we cannot but believe that your Board will coincide with us, in the preference we continue to give to the route by Morey's summit.

Computations have been made at the request of some members of the Board, to ascertain the cost of grading the

road from Worcester to Ryan summit, upon an undulating line, or upon a line with ascending and descending grades of 80 feet. The difference of cost between such a line as we are about to describe, and that upon which the first estimate was predicated, will be about $150,000. This is undoubtedly a large sum to be saved, in grading a piece of road of only 14 miles in extent. But there are so many disadvantages attending a road constructed upon this principle, that the great saving in cost becomes, comparatively, a small consideration. It is proper to remark, that the calculations of the cost of grading this line, are made upon the supposition that the fillings are to be diminished in the same manner that it is proposed to reduce the cuttings; or in other words, that the undulations are carried both above and below the uniformly ascending grade upon which the first computations were made.

If, as in the case of the route by Ryan summit, we adopt a line, say, in no instance exceeding 40 feet per mile, but generally at 35 feet, and undulating upon it in such a manner that the grade shall never fall below this line; then the height of the summit will be increased, virtually, by an amount equal to the total sum of descents, viz. 138 feet. But as the object of grading the road upon this principle is to save expense in the cost of construction, and upon this line the cuttings and fillings being nearly equal, that is to say, they are in the ratio of 1 to 1.04, we should, to derive all the benefit from it in this respect, which this mode is susceptible of yielding, extend the grade below the line before referred to, in such a manner, that the quantity of fillings may be diminished, as well as that of the cuttings, if it is carried below, the amount of the descents will be increased 231 feet, and equating these two sums, 138 feet and 231 feet at the rate of 18 feet per mile, we find them equivalent to 7.68 miles, and 12.83 miles, respectively, or enumerating them thus:

Upon the lesser, and constantly ascending grade 13.82 miles.
Undulating above the uniformly ascending grade 21.47 "
" above and below " 26.65 "

or, in other words, the cost of transportation upon this line, by these three modes of grading, will be to each other, as 1 : : 1.55 : : 1.92, 1 being the lesser and uniformly ascending grade. This must hold true, unless the engines

were permitted to exert their whole power, uniformly as well on the descents, as on the ascents, of the undulating planes, but this could not be allowed, for in practice there are many circumstances, which limit the speed of an engine, both in reference to safety, deterioration of the machinery, and the difficulty of arranging the slides for extreme velocities; or rather of suiting them to the variable velocities, which such a system would render necessary. For these reasons, it has never been considered expedient to calculate upon a velocity, on a descending plane, greater than that which might be permitted upon a level, with safety; and upon such steep planes as 80 feet, not even so great. But in order to compensate for the loss of time in ascending, the velocity required to produce this effect on the descending planes, would be entirely inadmissible; therefore the difference of time in descending by the regulated velocity, and that which would be required to compensate for the loss of time in ascending, would be lost on the undulating line.

A very serious objection to this principle of grading, is to be found in this, viz. the route across the summit, in addition to its grade of 40 feet, is necessarily a crooked one, and in order to overcome the total resistance, it is essential that the curves be diminished to the greatest extent practicable. In doing this, we are very often obliged to encounter deep cuts, at the points of the ridges and spurs; and it is at these places that many of the *deepest* cuts will be found. Applying the undulating principle at these points, and thereby increasing the grades to 80 feet, they might, added to the curves, present a combined resistance, too great, in many cases, for the power of the engine to overcome.

In another view, the objection is equally serious. The practical difficulty of working an engine upon such a line would be exceedingly great. To those who have examined the subject, it is known that the engine works to very great disadvantage when the velocity has to be constantly changed; and to work effectively, it is previously regulated for a *particular* velocity, and the valves arranged accordingly. It is not simply the question of letting into the cylinders a greater or less quantity of steam; but it is in adapting what is technically called the lead, to the velocity which it is designed to travel with. This lead is different in

amount for different velocities. A certain velocity is necessary to generate steam; of course this velocity would be attained in the descents; but evidently it would be unsafe to give the engine such a load as might reduce the speed on the ascents below that which would be required to produce steam.

To one who has travelled upon roads with steep grades, the truth of this remark must be known—he must have occasionally witnessed the entire stoppage of the train.

After giving to the subject the mature consideration which its importance demands, we are fully of the opinion, that nothing has been developed by the recent surveys, which justify us in changing the opinion we expressed in the last Report, and we now respectfully reiterate that we consider the route by Morey summit entitled to your preference, and accordingly recommend that it be adopted.

The accompanying Tables (A. and B.) contain a synopsis of routes 13, 14, and 15, referred to in the above Report. They exhibit every detail, necessary for a comparative view of the several routes. The former contains the length, grade, excavation, embankment, cost, &c. of each. The latter contains the length of each curve, with the length of the corresponding radius.

WM. GIBBS McNEILL,
GEORGE W. WHISTLER, } ENGINEERS.
W. H. SWIFT, RESIDENT ENGINEER.

☞ *In a number of the first impression the formula at page* 31 *is erroneously printed, it should be*

$$L = l - \frac{(E + l)\,g}{g + f}$$

SYNOPSIS OF ROUTES.

No. 13. Route by Henshaw Ridge to Grout Summit.

Stations.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Desc. of Grade Feet.	Total Descent.	Elev. of Grade above B. & W. R. R.	Elev. of surf. of ground ab. B. & W. R. R.	Grade. Per Mile.	Excavation. Earth.	Excavation. Rock.	Excavation. Loose R.	Embankment.	Bridges. Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.
0																		
53	5300	1.004	1.004	10	10			10	37.74	9.96	23675.8	739.5		29343.2		230		12394 70
149	9600	1.818	2.822	30	40			40	41.84	16.50	156148.6		6622.6	115228.2		378		48765 60
213.79	6479	1.227	4.049	165	205			205	222.66	136.12	265967.5		27479.6	14460.6		366	600	84985 50
232.79	1900	0.359	4.408	5	210			210	210.59	13.89			1888.3	11064.1		64	650	6640 30
302.79	7000	1.325	5.733	110	320			320	317.38	82.98	103118.0		8178.0	70737.7		752	1000	34315 30
327.79	2500	0.473	6.206	22	342			342	343.13	46.46			1088.0	14020.6		176	1700	4549 80
421.79	9400	1.780	7.986	18	360			360	360.53	10.11		20710.0	3077.0	167951.5		374	2700	68933 60
451.79	3000	0.568	8.554	15	375			375	388.20	26.40	46099.0			11208.7			500	15086 70
479.53or 609	2774	0.525	9.079			25	25	350	345.50	48.00				29944.9		82		9250 50
609 to 655	4600	0.871	9.950	50	425			400	407.25	57.39	6804.3		1844.0	2155.4		142		16151 40
709 or 745	5400	1.020	10.970	30	455			430	445.75	29.33	27697.4	6614.7	1833.2	37428.8		490	300	18152 50
805	6000	1.136	12.106			90	115	350	358.36	79.20	24305.1	16205.5		33596.7		466		31047 60
870	6500	1.231	13.337			100	215	250	255.83	81.23	75756.2	13999.9	4524.1	8780.8		70	500	41955 20
925 or 914	5500	1.041	14.378			98	313	152	155.13	94.08			2640.0	69102.4		266		23529 50
926	1200	0.227	14.605			2	315	150	145.38	8.80	14189.0			911.8				3547 20
983.5	5750	1.089	15.694			0	315	150	150.00		53083.9			20198.0		68		28106 70
											805652.4	58269.6	58774.8	688930.1		3924	7950	447412 10

No. 14. Route by Henshaw Ridge to Grout Summit, passing south of Manual Labor School, and south of Jones's Tavern.

Stations.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Desc. of Grade Feet.	Total Descent.	Elev. of Grade above B. & W. R. R.	Elev. of surf. of ground ab. B. & W. R. R.	Grade. Per Mile.	Excavation. Earth.	Excavation. Rock.	Excavation. Loose R.	Embankment.	Bridges. Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.
0																		
58	5800	1.098	1.098	2	2			2	0.37	1.82			198.0	69911.2		392		21638 20
105	4700	0.890	1.988	32	34			34	34.69	35.95	31912.0	8499.8		27960.0		172		20870 90
129	2400	0.453	2.441			19	19	15	17.40	41.80	17672.0			23572.7				9333 00
142.6 or 147	1360	0.258	2.699	7	41			22	22.58	28.43				29202.4			688	8461 50
232.13 or 236	8913	1.688	4.387	188	229			219	210.59	111.53	155431.0		6873.0	149754.2				47184 60
232.79 to 302.79	7000	1.325	5.712	110	339			320	317.38	82.98	103118.0		8178.0	70737.7		752	1000	34315 30
983.5		9.961	15.673								256742.5	57530.1	14606.3	432993.1		2134	5700	260310 70
											564875.5	66029.9	29855.3	814131.3		3450	7388	402114 20

SYNOPSIS OF ROUTES—*(Continued.)*

Stations.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent.	Desc. of Grade Feet.	Total Descent.	Elev. of Grade above B. &W. R. R.	Elev. of surf. of ground ab. B.& W.R.R	Grade. Per Mile.	Excavation. Earth.	Excavation. Rock.	Excavation. L. Rock.	Embankment.	Bridges. Feet.	Culverts. Perches.	Grubbing. Feet.	Amount.
No. 15. Route by Inclined Plane.																		
709 or 745			10.949					430	445.75		397541.3	35824.5	22691.2	686644.8		2580	6888	273928 00
760.	1500	0.284	11.233			10	10	420	425.52	35.20	23727.4	4277.0						11705 60
798.	3800	0.719	11.952			140	150	280	281.88	194.52	26544.0	5888.8		15176.4		238	350	16105 80
833 or 821	3500	0.662	12.614			56	206	224	210.53	84.48	54223.3			82593.6			1400	24346 30
871.	3800	0.719	13.333			64	270	160	157.99	88.92	62573.6			27380 7		248	2200	17413 30
926.	5500	1.041	14.374			10	280	150	145.38	9.60	20334.6			8724.6		216		8115 50
983.5	5750	1.089	15.463					150	150 00		53083.9			20198 0		68		25106 70
											638028.1	45990.3	22691.2	840718.1		3350	10838	379721 20

RECAPITULATION.

ROUTES.	Elev. of Summit above B. &W. R. R.	Elev. of Grade at do. ab. B. & W. R.R.	GRADE. 0 to 10 ft.	10 20	20 30	30 40	40 50	50 60	70 80	80 90	90 100	111.53	136.12	194.52	Total Length. Miles	Cost of Grading and Bridging.	REMARKS.
No. 13. By Henshaw Ridge.	445.75	430	2.320	3.957	1.588		0.998	0.871	1.136	2.556	1.041		1.227		15.694	447412 10	
No. 14. By Henshaw Ridge.	445.75	430	2.414	1.780	0.258	2.478	1.151	0.871	1.136	2.556	1.041	1.688			15.673	402114 20	
No. 15. By Inclined Plane.	445.75	430	2.187	2.821	0.258	2.762	1.451	0.871		2.706		1.688		0.719	15.463	379721 20	

B

Table exhibiting the Radius of Curvature, and the aggregate length of Curves, in each Route.

From Sta.	To Sta.	Radius. Ft.	Cur. Ft.	From	To	Rad.	Cur.	From	To	Rad.	Cur.	From	To	Rad.	Cur.
No. 13. By Henshaw Ridge				379	382	1432.5	300	825	843	1041.8	1800	149	154	1432.5	500
1	5	1146.	500	382	393	955.	1100	844	853	1041.8	900	191	199	5730.	800
26	31	2292.	500	456	465	1910.	900	866	897	1432.5	3100	205	209	2865.	400
70	83	2865.	1500	473	480	2865.	700	898	902	1432.5	400	215	221	1910.	600
103	112	3820.	900	609	612	1637.	300	905	920	1432.5	1800	225	232	1432.5	800
155	167	5730.	1200	626	632	2292.	600	932	951	2865.	1900				
190	198	2865.	800	661	668	1432.5	700					No. 15. By Inclined Plane.			
296	308	5730.	1200	680	687	2865.	700	No. 14. By Henshaw Ridge.				757	762	1910.	500
323	328	5730.	500	762	766	1146.	400	15	25	5730.	1000	797	816	1041.8	1900
328	339	1910.	1100	771	784	716.2	1300	61	64	1432.5	300	856	869	1432.5	1300
352	360	3820.	800	796	802	955.	600	65	69	1432.5	400	896	903	1432.5	700
371	379	3820.	800	803	812	1146.	900	126	132	1432.5	600	932	951	2865.	1900

Recapitulation.

Rad.	Rad.	Rad.	Rad.	Rad	Rad.	Rad.	Rad.	Rad.	Rad.	Rad.
7162	955	1041.8	1146	1432.5	1637	1910	2292	2865	5820	5730

No. 13, Route by Henshaw Ridge.

1300	1700	2700	1800	6300	300	2000	1100	5600	2500	2900

No. 14, Route by Henshaw Ridge.

1300	1700	2700	1300	8900	300	2600	600	3700	1600	3500

No. 15, Route by Inclined Plane.

	1100	1900		5600	300	3100	600	3700	1600	3500

REPORT

UPON THE

EXPEDIENCY OF GRADING THE ROAD FOR A DOUBLE TRACK.

Worcester, December 20th, 1836.

THOMAS B. WALES, Esq., President of the Western Rail Road Corporation.

Sir,

Your communication of the 12th November, calling upon the Engineers and Resident Engineer, for an opinion upon the expediency of constructing the First Division of the Western Rail Road for a single track was duly received.

It was intended to postpone a reply to this communication until the Report for the January meeting of the Board was prepared, and to state in it, fully, the disadvantages, which we conceived would arise if the order of the Board of 4th October, directing the road to be graded for a single track were adhered to, but upon further reflection, we have considered it our duty to anticipate the period of the Directors' meeting, in order that sufficient time may be afforded for the members of the Board to consider the reasons, which we deem it proper to offer against the proposed width for the track.

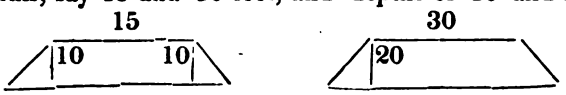
The order specifies that the cuttings shall be from 14 to 20 feet in width, and the embankments 12 feet at the surface.

We propose in the first instance to consider the subject in respect of the cost alone, intimating, respectfully, at the same time, that in our opinion the question should be treated independently of cost, upon the ground that the road should be graded for a double track, even if it be not intended to lay down more than the single track—and this for the reasons which we shall assign in their place.

The road being graded for a single track, the rails of course would be laid upon the middle of the bed, and not upon the side, as in the case of a bed for a double track; this being the case, we shall assume that the road bridges and stream bridges are to be of a width sufficient for two tracks, for the well known reason, that the expense of removing the wing walls, for the purpose of widening the abutments hereafter, would be greater than the cost of making them the full width in the first instance. The culverts we may make conformable with the width of the embankments, as they may be extended for a double track at any subsequent period without much additional expense. We shall further state that the maximum width authorized for the cuts (20 feet,) is barely sufficient to afford space for the ditches necessary to drain the road.

Upon these premises, we proceed to exhibit the difference in cost between the double and single track.

In level cutting, when the depth of the cutting (or filling) amounts to $\frac{2}{3}$ the width of the surface of the road, the areas of the sections of the slopes become equal to that of the bed. The cost in that case, therefore, of the bed and of the slopes will be equal. If the depth of cutting be greater than two thirds the width of the surface of the road bed, the ratio of expense is a decreasing one. If the cutting be less than $\frac{2}{3}$, the converse is true. Take, for an example, two widths, say 15 and 30 feet, and depths of 10 and 20 feet,



here the depth is $\frac{2}{3}$ the surface width, and the slopes contain the same quantity of earth which the bed itself contains.

Now take two other cases in which the widths shall be the same as in the former case, but the depths different, say widths, 15 and 30, and depths of 5 and 30, in this the depth in the first example, is $\frac{1}{3}$ less than is required for equal expense, and in the second it is $\frac{1}{3}$ more, and the ratios are 37.5 : 75 and 1350 : 900; that is, in the first case the bed costs twice as much as the slopes, and in the second it is only $\frac{2}{3}$ the cost of the slopes, hence for heavy work, similar in character to that upon the first division, the ratio is in favor of the double track.

We shall further premise, that twelve feet for the embankments (the width ordered) is too narrow for safety at all times, and too narrow to admit of being worked without great loss of time. We shall assume 16 feet as the least admissible width, even for the narrow track.

Taking Sections 10, 11, 12 and 13, embracing about 4 miles of the road, we shall exhibit the gross amount of cutting and filling upon each, with the cost of the same at the prices at which the contracts are made—both for double and single track.

SECTION 10.

Width track.	*Cutting.*	*Filling.*	*Cost.*	*Difference.*
20 and 16.	33684.7 yds.	42729.7 yds.	9827.67	2798.18
26 and 26.	39209. "	54895. "	12625.85	or 23 per cent.

SECTION 11.

20 and 16.	52772. yds.	59801. yds.	20930.35	3765.67
26 and 26.	60472. "	70560. "	24696.	or 15 per cent.

SECTIONS 12 AND 13.

20 and 16.	172755. yds	183641. yds.	89984.09	6945.91
26 and 26.	194400. "	215400. "	96930.00	or 8 per cent.*

The average of the difference in cost, as above, is about 15 per cent. We shall assume $\frac{1}{5}$ to $\frac{1}{6}$ as the additional cost of grading the road for a double track throughout the division. The total difference upon this hypothesis, for the 19$\frac{1}{4}$ miles will be about 75,000 dollars; upon the supposition also of all the excavations being earth, and earth and loose rock, in the proportions estimated in the four above named sections. In the case of a rock cut, there being but an inconsiderable slope to be given to the sides, the expense of the cuts would be nearly in the ratio of the widths, or 26 : 20, say 28 per cent.

* In consequence of some modifications made in the grades of the line across the summit, the amount of cutting and filling as stated in the above table is less than the quantity furnished by the final computations upon the established line. This does not affect the principle, however. The *comparative* results are all which we are desirous of presenting to your notice at this time.

The contractors in their proposals for executing the work, have made a difference in favor of the double track, of from one to four cents per yard for earth, from 2½ to 10 cents for loose rock, and from 5 to 30 cents for solid rock.

It remains to us now to state such objections to the width as at present entered as appear to us obvious. They may be thus summarily enumerated.

1. The difficulty and disadvantage of working any amount of force either in the cuts, or upon the embankments, particularly the latter, 12 feet in width not allowing sufficient space for the carts to turn or pass each other without liability to accident, the carts being 6½ feet at the axles, and the embankment but 12 feet, the consequence in the manner referred to is obvious. We may add in this place the proof of this by stating that even now, the carts upon the only embankment which is carried out, have been precipitated some half dozen times while turning or passing each other.

2. The embankments being constructed, and in places rising from 30 to 60 feet in height, with a surface width of 12 feet only, what might we expect their condition to be at the end of a season—affected as they must be by the action of the frost, and washed into gullies by heavy rains? They might, by the effect of single storm, be rendered impassable.

3. In the event of an accident to a train of cars upon an embankment, by which they should be thrown off the rails, now space is necessary to work, in order to replace them upon the track: and while this may probably be done if they are not broken, what is the alternative if they are, say a wheel?—there is no room upon either side of the track for them to remain for another train to pass, but must effectually stop the passage of every thing, until they can be removed from the bank, by being lowered perhaps into a swamp or ravine, from which it may be equally or more difficult to get them again upon firm ground.

4. It has been said that if these difficulties occur, and the narrow bed is proved to be too inconvenient, that the track may, at any subsequent period, be widened, and at a less expense, even, than in making it sufficiently wide for a double track in the first instance. The great difficulty, and

we might say impracticability of this proceeding, is too evident to any one having the least knowledge of the matter, to require an answer. We might take for an example the rock cut on the Worcester Rail Road, and ask, in increasing the width of the track at that place, what might and probably would be the effect of a single blast? It requires but little reflection to answer, that the road might, at any moment be rendered impassable, and in such a manner, that all the force within the control of man could not remove the obstacle in 24 hours. The road being graded for a single track, the rails of course would be laid in the middle of the graded surface; the whole would of necessity have to be taken up before the second track could be laid, and therefore the case is very different from that in which the road is prepared for two tracks in the first instance.

5. The difficulty of forming a new embankment against an old one, (such as would be required in the widening of the road bed,) is not to be overlooked. A writer upon this subject says, "It may be proper to advise that new banks ought not to be placed upon steep ground without considerable care in first forming it into levels, like steps, to prevent the slipping of the new part, as happened near Bradford on the Kennet and Avon canal; after all the care that was taken, great lengths of the canal slid down into the Avon river below."

From the foregoing statements, the conclusions which we arrive at are these:

First, That it appears to us that sound policy would dictate the propriety of grading the road sufficiently wide for two tracks, even upon the supposition that but one is to be laid down. In fact the width usually assumed for two tracks, is scarcely more than is requisite for one, to insure proper drainage, and to clear the road bed of snow.

Second. If it should be deemed expedient by the Board to adhere to the resolution of the 4th October, directing the road to be graded for a single track, we would state the necessity of extending the width of the embankments to 16 feet upon all parts of the road: that upon the 12th and 13th Sections, embracing the summit, and where both cutting and filling are heavier than upon any other portion of the line, the road be graded for two tracks, the cuts to be widened for an opportunity to drain the bed thoroughly,

and the embankments to be extended, for safety. The difference in cost, at the prices agreed upon with the contractors, as is stated in the table above, is $6945 91, or only about 8 per cent. additional, and this upon a length of road of about 2 miles. The difference in price between a double and single track, being upon these sections 4 cents per yard for earth and loose rock together, and 10 cents for solid rock.

Third. We would respectfully suggest, for your consideration, the propriety of modifying the order of the Board in reference to the width of the track, in such a manner, that your engineers be invested with discretionary authority to alter the width of the cuttings and fillings at such points of the road as may seem to them judicious and proper, according to the circumstances of the case. A single fact will serve to show the necessity of this measure. In many cases the embankment exceeds the excavation; to make up the deficiency, the obvious course would be to widen the cut sufficiently to form the embankment, in preference to borrowing earth elsewhere. This is a single instance, but it will convey an idea of the inexpediency of defining too closely these matters of detail; they are in most instances contingent in their nature, and require to be arranged and suited to each particular case.

We omit all reasoning on this part of the Report, which we think might, with propriety, be based on the eventual responsibilities of your Engineers for whatever strictly pertains to their profession.

Respectfully submitted,

WM. GIBBS McNEILL,
GEORGE W. WHISTLER,
W. H. SWIFT.

REPORT

ON THE

SURVEYS BETWEEN SEVEN MILE RIVER IN BROOKFIELD,

AND TEKOA MOUNTAIN IN MONTGOMERY.

Worcester, Jan. 15th, 1837.

To the President and Directors of the Western Rail Road Corporation.

Gentlemen,

The Reports which were made to the Board on the 15th of August, and 30th of September last, contained a description in detail, of the several routes which were surveyed and approximately located, between the villages of Worcester and East Brookfield, and the order of the Board of the 4th October, confirming the location recommended by the Engineers, in their Reports above referred to, established that portion of the line. It becomes our duty, now, to lay before you a statement of the operations of the Engineer department since the Report of 30th September was adopted by the Board.

Immediately subsequent to that period, the requisite measures were taken for the definitive location of the route between Worcester and East Brookfield, comprising the first division of the road, and on the 19th of October, this portion, embracing an extent of 19.5 miles, was advertised for contract. Proposals were invited until the 20th November, and propositions from a large number of efficient and experienced contractors were received. Upon such of the sections as the proposals appeared to be suitable, and advantageous to the Corporation, decisions were made, and the work was let; while upon others, embracing portions of the work of greatest magnitude, the decisions were deferred, to afford full time to the contractors to acquaint

themselves with the character of the work. About the middle of December the entire division was placed under contract; and about the same time the grading was commenced on the tenth and eleventh sections. Since that period, the work has been commenced on six other sections, and the balance will be in progress in a short time.

The surveys, upon which a Report has been made, terminated, as has been stated, near the Seven mile river, in East Brookfield; and at this point, only, may the line be said to have reached, fairly, the Chickopee valley. We have now to trace its direction, as it has been approximately located, in its course towards the Connecticut river.

From the crossing of the Seven mile river, near Gallup's mills, down to Taft's scythe factory, in the western part of the town of Warren, about eleven miles, the line pursues, without any deviation, the immediate valley of the Chickopee river; crossing it, in this distance, eight times, to avoid abrupt curves, and to take advantage of the best ground. From this factory, two routes were surveyed—one across the peninsula upon which Palmer village is situated—and the other, around by the valley of the river. The distance by the Palmer village line, is nearly two miles shorter than that by the river line; but it will be seen, hereafter, that we cannot pass the Palmer summit. The lines unite again, near Sedgwick's tavern, on the Chickopee river, about 10.4 miles, by the river line, below the scythe factory. At Sedgwick's, the Chickopee bends away to the north, to its junction with the Ware, and Swift rivers, at the village of Three Rivers; while the route continues, by a very direct course across a second peninsula, and through the valley of Baptist brook. At 3½ miles beyond Sedgwick's, the river, after having made its circuit to the north, returns south, and washes the base of the Wilbraham mountain, (so called,) and at this point the route falls upon the stream again, and continues near to it 2½ miles, to the point of Stony hill, also in Wilbraham, and about 7½ miles east of the Connecticut River. At this place, the hill and the river nearly close again, leaving a flat space between them of some 300 or 400 feet.

The point of Stony hill, we have considered to be the termination of the Chickopee river division; that is to say, any, or every route, by the valley of that stream, must

finally pass by, or near this point, and as it is necessary to fix upon some particular spot which shall be common to all the routes extending west, across the Connecticut River, in order that comparative estimates of the cost of grading may be presented, we have decided upon this as the most suitable point.

The above general description will serve to show the main direction of the line between the end of that portion of the Rail Road, which is located and put under contract, and the extremity of the plain, or flat land, which lies on the east side of the Connecticut river. To this it may be well to add a more detailed statement of particular portions of the route. From the Sturbridge road (the end of the first division,) to the point of Cranberry hill, in South Brookfield, the line is straight nearly 3 miles; it crosses the Five mile River 800 feet south of the Furnace village; and thence across a part of the north end of the Great Swamp. Of the 4000 feet of this swamp, which the line passes over, about 2000 feet of the distance is impassable for teams, except in winter. The soundings upon it are from 18 inches to 5 feet, but usually less than 2 feet. Therefore the material, which will be thrown up from the ditches, and the sides of the road, will furnish a considerable portion of the embankment; and the residue can be conveniently obtained from the points of hard land, which form the boundary of the swamp. Turning the point of Cranberry hill, upon a curve of 2865 feet radius, the line is straight to Stone's hill, upwards of a mile. The greater portion of this distance is over an arm of the Brookfield meadows. These meadows, also, are too soft for teams. Roads are made across them, and the bed of the Rail Road can be constructed over them without much additional expense. The soundings are generally from 3 to 4 feet; a few places 9 or 10, and at a very few, 12 feet will not reach the bottom. At Stone's hill, the line curves to the north upon a radius of 5730 feet, and by crossing the river twice to cut off an abrupt bend, it reaches, in 1¼ miles of straight line, the county road from West Brookfield to Brimfield; thus from the Seven mile River to the west parish of Brookfield, we have, with the exception of the two moderate curves at Cranberry hill, and Stone's hill, a straight line of 6¼ miles; and, inasmuch as the point named first, presents a

very favorable position for a depot where the trains will stop, the line may in fact be considered straight. From the Brimfield road the line curves to the west, upon a radius of a mile; and crossing the Chickopee River, it falls upon the point of Long hill; turning this hill upon a radius of 2865 feet, it continues straight, nearly to "Warren city," 1½ miles.

From the Five Mile River to Warren city, 8½ miles, there is but 5 feet fall in the Chickopee river, or about 0.59 feet per mile; while in the next succeeding 5½ miles, the fall is 212 feet, or 38.50 per mile; thence for 5½ miles, it is 78 feet, or about 14 feet per mile. This will serve to show how unequally the fall in this portion of the stream is distributed, and consequently the character of the grades which must be given to the road,

Passing through the south part of the city, or village, of Warren, upon a curve of 3820 and 2865 feet radius, the line passes under the high hill, south of Moore's mill-pond. From thence to Blair's saw-mill, at the north point of Grattan mountain, the valley of the stream is much contracted, and very crooked. To avoid a constant succession of curves in this, the steepest part of the road, it may be necessary to cross the river eight times, in a distance of about 3 miles, or resort to the expensive alternative of making deep cuts across the bends of the stream. After passing Blair's saw-mill, the river runs due south 4 miles. Upon this portion of the route, lines have been located upon both sides of the stream, and connected with each other at intermediate points. The main line, (as we now consider it,) continues down on the east side of the bend of the river, to a point below Capt. King's, there crossing the stream; it continues on the west side to Fenton's; here the river turns off to the west, and the line pursues the north side of it, to a point ¾ of a mile east of Sedgwick's tavern; the river here runs to the north, and the line after crossing it for the last time, passes over a slight summit to the valley of Baptist Brook; from thence it is straight, nearly two miles, to the point of the Wilbraham mountain; turning this point, upon a radius of 2865 feet, the line is again straight, 2¼ miles to the point of Stony hill.

As this portion of the route, (from E. Brookfield to Stony-hill,) stands in a manner by itself, there being no other

than the route by Palmer village, which it is necessary to compare with it, we shall state concisely, in this place, the general results furnished by the surveys and computations.

Length of the line from the Sturbridge road (end of 1st Division) to Stony hill - - - Miles, 27.13
Maximum grade - - - - Feet, 42.48
Estimated cost of grading and bridging, for a single track (20′ & 12′) - - - $546,040.00
Per mile - - - - - 20,120.00

The curves upon this line are as follows: 6 of 5730 feet radius—16 of 2865 do.—6 of 1910 do. and 1 of 1432.5—the last reducible (probably) to 1671 feet.

The Palmer village line in a distance of 10.32 miles (from the point whence the routes diverge, to that where they unite,) is 1.93 miles shorter than the line by the river. The rise from the scythe factory to Gammell's summit, in Palmer, is 132 feet, and the distance 2.84 miles; thence across the deep valley of Gammell's or King's Brook to Davis's, the descent is 27 feet, and distance 1.14 miles. From Davis's to the Chickopee River, below Sedgwick's, the descent is 340 feet, and the distance 3.44 miles, or about 100 feet per mile. This, of course, is inadmissible. But in addition we may add, that the grading, even upon these inclinations, could not be effected, unless at great cost. We consider, therefore, that the route by the river should be adopted.

We now proceed to the description of the routes across Connecticut River, between Stony hill and Tekoa mountain.

From the western termination, at Stony hill, of the division first described, to Tekoa mountain, (near the line between the towns of Westfield and Montgomery,) a distance of about 20 miles, several routes have been surveyed, and approximately located, with a view to ascertaining the best practicable line between these two points. They embrace an extent of about 5 miles, on the Connecticut River, viz. from the mouth of the Chickopee on the north, to Mill River on the south.

That part of the plain which lies on the east side of the river, and heretofore referred to, is, generally speaking, undulating, with occasional pond holes, and ravines, scattered over its surface; but no considerable ridges, or knolls, are to be found upon it. Its descent towards the river is very gradual, say from 5 to 10 feet per mile. The bed of the

river itself is about 170 feet below the plain, and the bank of the same about 150 feet below. On the west side of the Connecticut, this plain is interrupted by a ridge, which extends south, from the elevated ground near Northampton, and runs nearly parallel with the river, through the whole length of the town of West Springfield. The ridge in this extent is broken at two places only, viz. at Bush's Notch, west of the mouth of the Chickopee river, and at Morley's bridge, a little north of west of the village of Springfield. At the first of these points, it may more properly be called a depression; at the second, the Westfield River cleaves it to its base. It is through these two gaps that all the routes pass, in their course to the west.

The northern line, which we designate the Cabotville route, commences at the point of Stony-hill; and to the Connecticut River, a distance of 7.90 miles, it is virtually straight, there being but two curves of large radius upon it (and one of these, even, might be thrown out) it passes over the plain by easy grades, about $\frac{1}{4}$ mile south of Jenks's or the Ludlow factories, thence north of Dimick's pond, and Five mile pond, and about $\frac{3}{4}$ of a mile south of the Chickopee factories; opposite this point, the descent commences at a grade of 48.50 per mile, crossing the river just below the mouth of the Chickopee, by a bridge 1050 feet in length, the line ascends to Bush's Notch, before referred to. The depression in the ridge at this place is 237 feet above the Bench Mark, at the eastern abutment of the Springfield bridge, and by the line as located, is $3\frac{1}{2}$ miles from the west bank of the river. The ascent is effected at grades of 83.31, 56.57, and 38.48 feet per mile. From the Notch to Tekoa mountain, the route is very direct; the descent to the plain at Sacket's brook, is at grades of 40.33 and 15.36 feet per mile; thence ascending 41.12 per mile, thence descending to the canal feeder at Tekoa 24.84 per mile. The total descent west from the Notch to the feeder at Tekoa is 127 feet.

If the extraordinary height of 50 feet for the bridge at the Connecticut were assumed, the grades would be reduced from 48.50 to 42.50 per mile on the east, and from 83.31 to 74.31 on the west side of the river. In such a case, the cost of grading and bridging would be increased $28,746.47.

The whole distance from Stony-hill to Tekoa, by this route is - -	Miles	19.32
Maximum grade - - -	Feet	83.31
Estimated cost of grading and bridging		$422,060.40
Cost per mile - - - - - -		$21,840.00

The second line is called the End Brook route. It passes straight from Stony-hill to Hog-pen dingle (a small branch of Chickopee river) crossing in its course a part of Dimick pond, and Five mile pond. From the Hog-pen dingle, it curves gently into the ravine of End-Brook, and follows the valley of this stream to Daniel Hitchcock's, descending at a grade of 36.16 and 55.00 feet per mile. From Hitchcock's, two routes across the river were surveyed—the first to unite with the Cabotville line, near Bush's Notch, and the second to unite with the Garden Brook line (hereafter to be described) near Ashley's mill, on the Westfield river. The first, or northern branch, leaves the valley of End-Brook, at Hitchcock's, and passes straight across the river, about midway between Cabotville and Springfield, by a bridge 700 feet long, to the ravine of Darby Brook, a small stream which enters the Connecticut, near the West Springfield Meeting-house; following a branch of this stream to its source, at grades of 54.30 and 38.25 feet, it turns north and falls into the ravine of another branch (the same upon which Pliny Bagg resides) thence crossing the heads of Ashley's brook and Block brook, it pursues a N. W. course, until it unites with the Cabotville line, a short distance east of Bush's Notch.

The distance by this route is -	Miles	20.85
Maximum grade - - -	Feet	55.00
Estimate - - - - -		$386,958.96
Per mile - - - - -		$18,560.00

The south branch of the End Brook route, being the third line examined, deflects from the north branch, at Hitchcock's, as before stated; and by a curve to the south it continues to descend the valley of End Brook, at a grade of 52.80 feet to the river, opposite the W. Springfield common; crossing the Connecticut at this point by a bridge of 970 feet

long, it pursues a direct course to its junction with the Garden Brook route at Ashley's mill.

The distance by this route is -	Miles	22.26
Maximum grade - - -	Feet	52.80
Estimate - - - - -		$291,440.97
Per mile - - - - -		$13,091.00

The fourth line is the Garden Brook route. This line as approximately located, is straight from Stony hill to the head of Garden Brook; crossing in its course Loon pond, and the south part of Five mile pond, by introducing two curves of 2 miles radius, as at present proposed, and represented upon the map, a better line would be obtained, that is to say, one of the ponds would be wholly avoided, and the other would be crossed at a very narrow part of it, and where the depth is but 12 to 14 feet, and in addition it would facilitate the entrance of the route into the Garden Brook valley. The distance would be increased by this alteration 300 feet or 0.05 per mile. This line descends from the plain at an uniform grade of 45.07 feet per mile; passes through the village of Springfield, and crosses the Connecticut by a bridge 1200 feet long at a point between the present bridge and Ferry street; thence by a curve of a mile radius, it winds into the valley of the Westfield river, and falls upon the stream at Ashley's mills, in the western part of W. Springfield, and unites at that point with the south branch of the End Brook route. From Ashley's mill to Morley's bridge, about 4 miles, the line continues upon the north side of the river, and generally near its margin, ascending at easy grades. From a point, a short distance beyond Morley's bridge, to Tekoa, two distinct routes were surveyed, one on the north, and the other on the south side of the Westfield Great River. Continuing by the north side, it will be necessary to embank to the height of about 8 feet for a distance of a mile, over the Westfield meadows, to guard against the effects of freshets. The greater part of the material required to form the embankment can be thrown up from the sides and ditches. Crossing the Hampshire and Hampden canal by a draw-bridge, the line passes over very favorable ground, until it reaches the canal feeder near Tekoa.

At this place it comes in contact with the feeder, and to provide a passage for both, it will be necessary to cut through the rock which forms the point of Tekoa, or pass the road over the feeder. The line as at present located, is upon the feeder bank, for a distance of 6000 feet. The width of this bank might be increased. But without considerable expense in giving it a proper foundation, by introducing substantial side walls along the river, it would be subject to the same evil which attends the feeder.

The distance by this route is - -	Miles 22.02
Maximum grade - - - -	Feet 45.07
Estimate - - - - - -	$308,215.50
Per mile - - - - -	$14,000.00

The sixth route is the Mill-River route. This line was surveyed and located, under the direction of Mr. Fessenden, in 1835. The estimate of the cost of grading this line, has been made up in the same manner that the estimates of the other lines have been made, (the grades themselves are Mr. Fessenden's). In order to connect it with our lines, it has been carried from the point at which it terminated near State street, to the river at the present crossing place of the Garden Brook line, between the bridge and Ferry Street.

From the point of Stony hill, the Mill River line, like the others, is straight, in its course over the plain; after falling upon the river near Scott's house, it pursues the valley, with frequent crossings of the stream, to avoid abrupt curvature, and descending at grades of 43, 16, 5, 21, and 42 ft. per mile, it turns the point of the high bank, near Mill Street, and from thence to its termination at State Street, it follows the same bank, nearly parallel to the Connecticut River; from State Street, it was connected with the Garden Brook line, in the manner referred to above.

The distance by this route is - -	Miles 22.68
Maximum grade - - - -	Feet 43.30
Estimate - - - - -	$319,531.61
Per mile - - - - -	$14,089.00

GENERAL SUMMARY OF ROUTES.

Route.	Length Miles.	Max. Grade. Feet.	Cost of gra. and bridging per mile.	Total cost of grading and bridging per mi.
Cabotville Route,	19.32	83.31	21840 00	422060.40
End Brook, (Bush's Notch,)	20.85	55.00	18560.00	386958.96
" (Ashley's Mill,)	22.26	52.80	13091.00	291440.77
Garden Brook, (N. side Westfield River,)	22.02	45.07	14000.00	308215.50
" (S. side " ")	22.20	45 07	15965.00	354433.89
Mill River Route,	22.68	43.30	14089.00	319531.61

The above estimates are for the track adopted by the Board, for the 1st Division, viz. 20 feet in the cuts, and 12 feet at the surface of the embankments.

We shall in the comparisons reduce the number of routes to four, by taking the main, or north branch of the Garden Brook line, and the south, or Ashley's Mill branch of the End Brook line; these branches being less in their cost than the branches by Bush's Notch, and the South side of Westfield river. We have then to consider the Cabotville route; End Brook route; Garden Brook route; and the Mill River route; and may thus recapitulate the advantages, and disadvantages of each.

1. *The Cabotville line.*

Its advantages are that it is the straightest, and consequently shortest, of all the routes, viz. 2.94 miles shorter than the End Brook—2.70 shorter than the Garden Brook, and 3.36 shorter than that by Mill River. It passes near the Ludlow Factories, near the Chickopee Factories, and through the village of Cabotville. Its disadvantages are that it has steeper grades than either of the other routes, that it has two summits between the Connecticut river, and Tekoa mountain, requiring three descending grades to the West, amounting to 127 feet, and that the cost of grading it, will be greater than upon either of the other routes.

2. *The End Brook route by Ashley's Mill.*

Its advantages are, that it passes through the village of West Springfield and Westfield—it crosses the river by a bridge 230 feet shorter, than that by either of the other

routes—the cost of grading is also less. Its disadvantages are, that it has steeper grades than any except the Cabotville, is more crooked from the plain to the river, than either of the others, and passes about midway between Cabotville and Springfield, avoiding both places.

3. *The Garden Brook route.*

In point of directness is second only to the Cabotville line; and with the exception of the Mill River line (which in its maximum grade is 1.77 less steep) has easier grades than the others; passes through the villages of Springfield, West Springfield, and Westfield; and with the exception of the End Brook route, can be graded for less than either of the others.

4. *The Mill River route.*

The grades of this line are better than either of the others, not only in having its greatest inclination less than that of the others, but in the general descent towards the river from the plain. Mill River being much longer than either Garden Brook, or End Brook, presents by its valley, greater facility in descending. It also passes through the three Villages enumerated in the Garden Brook line. Its disadvantages are, that it requires frequent bridging over the Mill River—is the most crooked—passes through very valuable property in nearly the whole of its extent through the village of Springfield—the cost of grading and bridging is greater than upon any except the Cabotville line; and the land damages upon that part of the line which lies within the thickly settled part of the village of Springfield, of upwards of 1¼ miles in extent, would be excessive.

From the foregoing statements, the relative merits of the several routes may be understood. In the End Brook route, notwithstanding the cost of grading may be $16,000 less than the Garden Brook route; yet we consider that its steeper grades, increased curvature, and its remoteness from the two business points on the river, (Cabotville and Springfield,) more than counterbalance the advantage which it possesses in respect of cost. The Mill River line

we conceive to be less favorable in its character, than the Garden Brook route, from its greater length, greater curvature, and greater cost. There remains then the Cabotville line, and the Garden Brook line, to compete for the preference.

Equating the Cabotville line at 19 feet per mile, (this being about the slope which requires double the power that is required upon a level,) we find that the 127 feet which this line descends from Bush's Notch towards Tekoa, is equal to 6.70 miles of level road; and upon the Garden Brook line, equating in the same manner, for the descent of 10 feet given to the line at the Pawcatuck valley, to reduce the embankment, we have 0.53 miles as the equivalent. The two routes, therefore, in respect of length, grades, and cost, stand thus:

Routes.	Actual distance. in miles.	Equated distance Miles.	Max. grade. Feet.	Cost of gradi g and bridging.
Cabotville route	19.32	26.02	83.31	$422,060 40
Garden Brook route	22.02	22.55	45.07	308,215 50
Difference	2.70	3.47	38.24	113,844 90

Thus it will be seen, that while the actual distance by the Cabotville line is 2.70 miles less than by the Garden Brook line, the equated distance, which is the measure of the cost of transportation, (and is perpetual,) is 3.47 miles more. The effect of this is, that the cost of transportation would be 15⅓ per cent. greater upon the Cabotville line, than upon the Garden Brook line. Again, the tolls being measured, not by the equated, but by the actual distance, the receipts from the two routes would be in the ratio of their lengths, or as 22.02 : 19.32, in favor of the Garden Brook route; in other words, the receipts upon the Garden Brook line would be 14 per cent. greater than by the Cabotville line.

From the results thus obtained, we find, that, in the Garden Brook line, the cost of grading will be less than that of the Cabotville line—that the cost of transportation will be less, and that the grades will be less. We do not hesitate, therefore, to award it the preference; and we respectfully recommend that it be adopted.

The following Maps, Tables, and Profiles accompany this Report. They embrace all information in detail, appertaining to the routes, which can be required in forming an opinion upon their comparative merits.

Table A, contains a synopsis of all the routes, from Stony hill to Tekoa mountain, exhibiting the length, ascents, descents, elevation, grade, excavation, embankments, bridges, culverts, and estimated cost of grading and bridging upon each stage of the several routes.

Table B contains the length and cost of various parts of routes not embraced in the synopsis.

Table C contains the radius of curvature, and aggregate length of curves of each route.

MAPS AND PROFILES.

No. 1. Map of approximate location from East Brookfield to Stony hill, and to the head of Garden Brook; also of the line by Palmer village. The whole on a scale of 1000 feet to an inch, or 5.28 inches to a mile.

2. Profiles of the same, with those of attempted improvements.

3. General Map of the country between Stony hill and Tekoa mountain, embracing all the routes which have been surveyed, and approximately located, between those two points. Also on a scale of 1000 feet to an inch.

4. Profile of the approximate location of the Cabotville line from Stony hill to Tekoa.

5. Profiles of the End Brook line from Stony hill, to its intersection with the Garden Brook line at Ashley's mill.

6. Profiles of the End Brook line from Hitchcock's by Darby Brook, to the Cabotville line, east of Bush's Notch.

7. Profile of the Garden Brook line from Stony hill to Tekoa by the north side of Westfield river.

8. Profile of the same, by the south side of the Westfield river, through the village of Westfield, to its junction with the main line, on the north side of the river, west of Tekoa.

9. Profile of the Mill River line.

The surveys and approximate locations of these several

lines, were made by Mr. Stebbins, Mr. Childe, and Mr. Barton, with their assistants, Mr. Werner, Mr. Gillespie, and Mr. Irving.

Surveys have also been extended by two distinct routes to the New York state line at West Stockbridge. That by the valley of the Great Westfield River, Washington, and Pittsfield, &c. we designate the North Route. That by the valley of the Little Westfield River, Granville, Otis, &c. we designate the South Route.

Upon the North Route, the line has been surveyed, and approximately located, entirely through to the New York boundary. From Tekoa mountain it passes through the towns of Russell, Chester, Middlefield, Becket, Washington, Hinsdale, Dalton, Pittsfield, Richmond, and the north-west corner of West Stockbridge.

The surveys, and approximate location of the route from Tekoa mountain to Pittsfield, were made by Mr. Childe, with the occasional assistance of Mr. Barnes, Mr. Irving, Mr. Gillespie, and Mr. Foot, as levellers. From Pittsfield to the New-York line, the approximate location was made by Mr. Potter, and his assistant, Mr. Bartlett.

An attempt was made at several points to ascend the valley of Walker Brook, in Chester and Becket, by an inclined plane, with a view to connect the North and South routes, near Green Water Pond in Becket; and thus avoid the great bend which the river route makes through Hinsdale, and Dalton. But after various unsuccessful efforts, the project was abandoned, the spurs of the mountain being found to be too numerous and formidable. These surveys were made by Mr. Barton, and his assistant, Mr. Irving.

Upon the South route several experimental lines have been surveyed, to wit:

1. A route branching from the Garden Brook line at Oakley's, two miles east of Westfield village, and by the valley of the Little Westfield river. South branch of do. or Peeble's brook, and Beech hill, to the summit, near the line between Otis and Blandford. This line passes through Westfield, the South East corner of Russell, Granville, Blandford, and North East corner of Tolland. The summit is in a Spruce swamp, near the Blandford line, and one mile east of East Otis village.

2. A route from Hodges', at the foot of the mountain near the Westfield and Russell line, by the north side of the Little Westfield river, and north branch of the same, to Lyon's summit, in Otis, 3¼ miles North West of the Spruce swamp, in Granville. This line passes through Russell, Blandford, and Otis.

3. A line branching from route No. 1, at the forks of the Little Westfield river, and through the valley of the north branch, nearly parallel with No. 2, to Lyon's summit, in Otis.

4. A line from the Garden Brook line at Oakley's, 2 miles east of Westfield, entirely south of the Little Westfield river, and across Poverty plain, to the foot of the mountain at Agar Noble's. Abandoned as impracticable.

5. A route from Westfield village, by the Powder mill, or the Little Westfield river, thence by the valley of Munn's Brook, and a branch of the same at Lovemonte's notch, around the south point of Sodom mountain, thence to Farnsworth's, Mount Pisgah, Reuben Noble's, and Flat lot, to the Cobble mountain, near Stowe's in Granville, thence turning south, until it reaches within ¼ of a mile of the forks of Little Westfield river, at Rowland Noble's in the South East corner of Blandford, thence through the North West part of Granville, and North East corner of Tolland, to the Spruce swamp summit, upon Route No. 1. This line passes through Westfield, Southwick, Granville, Tolland, and Blandford.

6. A route from the mouth of Munn's brook, in Westfield, near the Powder house before referred to, by an inclined plane to Mount Pisgah, north west of Agar Noble's, thence S. S. West to Farnsworth's, and intersecting Route No. 5, at Reuben Noble's, and from thence by it to the Spruce Swamp summit. This line is within the towns of Westfield and Blandford.

7. A route attempting to ascend the mountain at Agar Noble's, by following the valley of Munn's brook, on the east side, from the Powder house, 3½ miles south; thence crossing the brook, and continuing the ascent north, on the west side of the same, and on the eastern slope of Sodom mountain. Abandoned as impracticable.

8. A line from Senate's house, on the route by north

branch of Little Westfield river, across to the South route, at the Spruce swamp summit.

This completes the list of the routes surveyed on the east side of the summit. From the summit west to the New-York line, they are as follows:

9. Continuing Route No. 5, it descends from the Spruce swamp summit, until it reaches the valley of the Farmington river, ½ mile east of Centre Otis; thence by a very direct course, and easy grades, across the dividing ridge between the Farmington river, and the Housatonic, to Green Water pond, in the western part of Becket, thence descending by the valley of Green Water pond brook, chiefly on its north side, to its junction with Goose pond brook, in Lee, ½ mile east of the Housatonic river, thence by the valley of the Housatonic, crossing Hop brook valley at M'Allister's, and through South Lee to Stockbridge. From thence the line continues through the village of Stockbridge, and across the bend of the river at Phillips's, thence by the south side of Mohawk pond, to the summit between the Housatonic and Williams' River, at Fueri's house, thence north west, by the valley of Williams' River, to the Hudson and West Stockbridge Rail Road depot, in the village of West Stockbridge, and from thence by the route of said road, 2¼ miles to the termination of the Hudson and Berkshire Rail Road, at the New York state line, and at this point it unites with the North route through Pittsfield, &c. The western portion of Route No. 9 (from the Spruce swamp) passes through Otis, Becket, Lee, Stockbridge, and West Stockbridge. A branch of this line passing farther north leaves the main line east of Stockbridge village and crosses the dividing ridge between the Housatonic and Williams' River at the toll gate. On the Albany road (Curtis's) it unites again with the main line at the proposed depot of the West Stockbridge Rail Road in West Stockbridge village.

10. Returning to Route No. 5, in the North West part of Granville, a line was run through Tolland by Noyes's pond, to a summit at Coles's, about 6 miles south of the Spruce swamp summit, and 47 feet below it, thence turning north, and falling into the valley of the Farmington, near the North West corner of Tolland, thence pursuing this valley to the North East corner of Sandisfield, and there

abandoned, as the crossing of the Farmington valley was considered to be impracticable. Another line nearly parallel to this, but passing farther east, was attempted from Coles's summit. It passes by Messenger pond in Tolland, the south side of Cotton's pond in Otis, and interseets the western branch of this Route (No. 10,) near the outlet of Larkin pond in the South West corner of Otis.

11. From the point last mentioned, (outlet of Larkin pond) a line was carried across the Farmington River, through the Beech plain, and by the outlet of Spectacle pond, both in the north east part of Sandisfield, thence through the village of West Otis, to the head of Hop Brook, a branch of the Housatonic, and thence by the valley of that stream, and north of the Shaker village, to its junction with No. 9, by Green water pond, at M'Allister's, near the mouth of Hop Brook. This line passes through the north east part of Sandisfield, and the whole length of Tyringham.

12. From Green Water pond, a line was run on the south side of Green Water pond brook, and crossing Goose pond brook, about ¾ of a mile south east of Sturgis's tavern, thence winding round the slope of East mountain, into the valley of Hop brook, thence ascending this valley to a point opposite the Shaker village, in Tyringham, (referred to in the description of the last route,) for the purpose of getting a suitable place to cross Hop Brook, thence turning west, it unites with route No. 11, north of the Shaker village.

13. Leaving the Green Water pond Route, (No. 5,) about 2½ miles below the pond, between Barrett's and Shelden's, a line was traced on the side of the mountain, which forms the eastern boundary of the Housatonic valley, up to the Furnace in the north east corner of Lenox, crossing the Housatonic river at this place, it passes by the south side of Scott's pond, into Lee again, thence into the north part of Stockbridge, thence turning the north point of Rattle Snake mountain, it passes south of Great pond, and north of the village of Curtisville, and unites with the north branch of Route No. 9, at the toll-gate summit (Curtis's) on the Albany turnpike.

These routes were surveyed, chiefly, by Mr. Morgan, with the assistance of Mr. Barton, and Mr. Williams;

From the extent of country which it was necessary to examine, the surveys have been entirely experimental; and no one line has been approximately located. But from the facts collected, we have now the means of pointing out the best practicable line for approximate location, whenever it shall be judged expedient to make the same.

Respectfully submitted, by,

Gentlemen,

Your obedient servants,

WM. GIBBS McNEILL,
GEORGE W. WHISTLER,
W. H. SWIFT.

A SYNOPSIS OF ROUTES FROM STONY HILL TO TEKOA MOUNTAIN.

Stations.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Descent of Grade. Feet.	Total Descent. Feet.	Elev. of G. ab. Bench on Ct. R. Bridge.	Elev. of ground above B. on Ct R. B	Grade per mile.	Excavation, Cubic yards. Earth.	Rock.	L. Rock.	Embankment, Cub. yds.	Bridges. Length Feet.	Abutments & Piers. Perches.	Culverts. Perches.	Grubbing. Feet.	Amount.
No. 1. *Route by Garden Brook.*																			
Bench at Stony hill.								1775	195										
2565 to 2630	6500	1.231	1.231			9 5	9.5	168	185	7.717	73488.94			15437.83				300	16203 56
2680	5000	0.946	2.178			18	27.5	150	162.5	19.027	40402.14			40728.95				200	8984 36
2750	7000	1.323	3.503					150	154.5		26266.40			17863.39			51.371	1500	6061 34
2808	5800	1.098	4.602			5	32.5	145	151	4.553	8055.51			12253.10			62.947		2321 56
110	16400	3.106	7.708			140	172.5	5	*20	45.074	420553.54			54984.98	160‖	30.00	222.745	8900	104179 14
160	5000	0.946	8.655			5	177.5	00	†45	5.285				20973.95	1250*	5024.65	22.275		50950 81
294	13400	2.537	11.192	70	70			70	72.5	27.591	74431.23	4270.65		35014.42			332.839	4400	22373 00
320	2600	0.492	11.584					00	00	Level.	68156.65			39.35			17.190	1600	15220 84
360	4000	0.859	12.443			10	187.5	60	50	13.210	518.53			28542.03			74.295		2462 65
484	12400	2.353	14.796	8	78			68	74	3.407	63050.05	5654.96		35925.79			272.734		20778 30
548	6400	1.207	16.003					68	69	Level.	487.94			43936.29	30	564.30			11778 98
596	4800	0.909	16.912	18	96			86	87.5	20.902	1847.97			18848.97	30	109.29			2821 25
670	7400	1.401	18.313	7	103			93	110	4.996	59779.66			33468.31			123.524		13398 56
784	11400	2.169	20.472	72	175			165	‡163	33.148	15248.27			52538.60			335.021		12229 53
834	5000	0.946	21.418	5	180			170	167	5.285	22923.47	875.60		22603.45		624.00	1111.000		10746 21
865½	3100	.587	22.005	10.5	190.5			180.5	197	18.023	16915.78	1266.90	914.00	14302.80	50	270.46			7206 51
Total.			22.016								892126.08	12078 11	914.00	447462.21	1520	6622.70	2625.941	16900	308215 50
2d G. from 2808 to 2824	1600	0.303	4.905					145	151		3966.69			589.47					
2824 to 110. Childe's L.	14800	2.803	7.708			140	172.5	5	20	51.269	278609.58			44330.72	160	30	222.745	8900	70522 10
Total 2d Grade.											282575.27			44920.19	160	30	222.745	8900	70522 10

REMARKS.—Average haul on Garden Brook Line, 750 feet. Station 2862 of Stebbins's, is zero of Childe's Line. * Surface of water in Con. River. † Chickopee River Bridge. ‡ Below Bench. § Con. River Bridge. Pond Brook Bridge. Canal Bridge. ‖ Surface of water in Canal Feeder. Aqueduct for Canal Feeder. Canal Feeder Bridge. Total, admitting 2d Grades, from 2808 to 110=274425.46. Difference of cost between 1st and 2d Grades, from 2808 to 110=$33792.04.

SYNOPSIS OF ROUTES—*(Continued.)*

Stations.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade Feet.	Total Asc. Feet.	Descent Grade of Feet.	Total Descent. Feet.	Elev. of Gr. ab. Bench on C.R. Bridge.	Elev. of ground ab. B.on Con. R. Bridge.	Grade per mile.	Excavation. Cubic yds. Earth.	Rock.	L. Rock	Embankment. Cubic yds.	Bridges length Feet.	Abutments and Piers. Perches.	Culverts. Perches.	Grubbing. Feet.	Amount.	REMARKS.
No. 2. Route by Cabotville.																				
Bench at Stony Hill.								83.	195.											
0 to 104	10400	1.969	1.969					83.	183.	Level.	44702.53			27741.55			31.18	400	10391 94	Av. haul on Cab. l. 850 ft.
170	6600	1.250	3.219			29.	29.	54.	145.	23.200	39032.28			74969.27			124.00	2300	16812 86	*Below bench. †Sur. of water in C,. River. The canal G. lines will reduce the cost $28746. 47, incl. the dif. of cost in bridge, &c.
266	9600	1.819	5.037			4.	33.	50.	162.	2.200	58407.00			94321.95			378.44	2400	23739 92	
415	14900	2.822	7.859			120.	153.	30.	*21.	42.523	98239.87			52293.37			310.11	700	27267 75	
427	1200	0.226	8.087				153.	30.	†20.	Level.				9166.60	1050	10769.61			62901 81	
535	10800	2.016	10.103	152.	152.			82.	182.	74.311	273209.45			341473.74			1066.71	400	130209 11	
549	1400	0.294	10.397	15.	167.			9.	197.	56.571	867.90			3926.16			6.46		915 93	
608	5900	1.118	11.515	43.	210.			240.	237.	38.481	39886.45	25202.75		82984.64			458.01	1300	45565 28	
680	7200	1.363	12.878			55.	208.	185.	185.	40.353	33167.40			28263.87			104.81		7838 12	
790	11000	2.084	14.962			32.	240.	153.	143.	15.360	82713.66			117101.42	50	1887.60	808.86		33176 24	
880	9000	1.704	16.666	72.	282.			225.	220.	41.128	29739.23	‡28755.49		92342.96			85.57	500	39290 31	‡ Red Sand Stone.
965	8500	1.610	18.276			40.	280.	185.	180.	24.847	178241.51	3796.29		82420.65			450.40	1000	41988 68	Masonry for canal feeder Acqueduct.
	5500	of Garden Brook Line, computations to Sta. 865½									21884.28	1809.84	914	27148.19		894.46	1111.00		11404 92	Or with a bridge 80 ft. in height, $422060.40.
Total.	102000		19.316								899142.54	59564.37	914	1034654.37	1100	13551.67	4935.55	9000	450806 87	
No. 3. Route by End Brook to Ashley's Mill.																				
Bench at Stony hill.								183.	195.											
0 to 88	8800	1.666	1.666			4.5	4.5	178.0	178.	2.700	83623.19			43378.58			64.80	1700	18730 70	Average haul on End Brook Line, 800 ft.
189	10100	1.913	3.579			29.	33.5	149.	149.	15.160	34490.79			77725.47			126.36	4500	17872 32	
277	8800	1.667	5.246	11.	11.			160.	168.	6.600	58714.00			38007.55			78.21	2800	13409 50	
350	7300	1.382	6.628			50.	83.5	110.	133.	36.164	126099.17			50403.64			233.28	1300	28364 39	
450	10000	1.894	8.522			100.	183.5	10.	§ 2.	52.800	82011.83			250293.15			394.55	1000	55973 59	§ Below Bench.
464	1400	0.294	8.856							Level.				3315.73	980	4509.			38070 46	Connecticut River.
508	4400	0.765	9.621	15.	26.			25.	25.	18.000	139.33			14108.65			32.40		3168 70	
Total.			9.621								385078.36			477232.77	980	4509.	929.60	11300	175589 64	

SYNOPSIS OF ROUTES—*(Continued.)*

Stations.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Desc. of Grade Feet.	Total Descent. Feet.	Elev. of G. ab. B'h on Ct. R. Bridge.	Elev. of ground ab. B. on Ct. R. Bridge.	Grade. Per Mile.	Excavation. Cubic yards. Earth.	Rock.	Loose R.	Embankment. Cubic yds.	Bridges. length Feet.	Abutments and Piers. Perches.	Culverts. Perches.	Grubbing. Feet.	Amount.	Remarks.
No. 4. Route by Westfield Village.																				
445.26	of G.	Brook	Line					64.00	77.00											
to 480	2900	0.549	0 549			4.50	4.50	60.00	74.00	8.800	490.73			9714.65					2040 07	
531	5100	0.966	1,515	5.50	5.50			65.50	63.00	5.176	3923.68			12707.81	180	1285.564			10485 33	
648	11700	2.216	3,731	29.00	34.50			94.00	92.00	13.087	13499.92			24830.75	140	3896.64	911.25		10394 67	Bridge over L. Westfield River.
680	3200	0.606	4,337					94.00	92.00	Level.	25908.79			10708.20	30	109.29			5440 84	Canal Bridge belongs, and is estimated in 3d grade.
750	7000	1.326	5,663	8.50	43.00			102.00	95.00	6.041	7499 84			39184.46			128 27		5743 41	Bridge over Westfield River
(875)*	13100	2.462	8.125	68.00	111.00			162.00	135.00	27.269	120777.48		3546,60	85097.64	700	9808.9389	526.50	3300	71913 36	520 ft. of it instead of embankment over Canal Feeder.
881															50	174.000				
Total.	43066		8.125								172100.44			182243.51		11767.45	2720 45		106017 68	
No. 5. *From End Brook to Bush's Notch.*																				
398	of End Brook Line.							55.00	50.00											
48	4800	0.909	0.909			50.00	50.00	5.00	6.00	55.005	1249.98			225444.78			126.96		9271 71	Average haul on this line 900 feet.
218	17000	3.220	4.129	175.00	175.00			180 00	167.00	54.348	277519.48			52690.43	700	5484	336 21		10187 09	
287	6900	1.307	5.436	50.00	225.00			230.00	226.00	38.255	19920.85	2520275		118170.60			510 56		45263 37	Joins Mr. Barton's Cabotville Line at 604 Station.
Total.											298690.91	2520275		396305.81		5484	973.73	3300	156406 17	
No. 6. Route by Mill River to Springfield.																				
Bench at Stony hill.								177.50	202.50											
20	2000	0.378	0.378			6	6	171.50	157.50	10.800	16176.37			5481.68					5014 67	Average haul on this Line, 1600 feet.
71	5100	0.965	1.343					171.50	188.50	Level.	15462.35			9815.87			114.82		5022 96	
134	6300	1.193	2.536			27	33	144.50	129.00	22.628	15720.34			7581.98	20	534.60	24.50	5000	7398 10	
177	4300	0.814	3.350					144.50	148.50	Level.	11522.19			27538.00	30	1791.44	49.74	2100	14682 58	
216	3900	0.738	4.088			32	65	112.50	114.50	43.300	14643.46			19184.42			123.68	1800	6410 53	
240½	2450	0.464	4.552			7.50	72.50	105.00	104.50	16.183	12741.67			23840.48	30	757.94			10084 34	
271½	3100	0.587	5.139			2.50	75.00	102.50	97.50	4.258	55528.81			34829.26	60	2162.16			24540 31	
323	5150	0.976	6.115			20.00	95	82.50	88.50	21.100	57087.36			67505.49	170	1184.43	19 80	1000	23959 97	
406	8300	1.572	7.687			66	161	16.50	10.00	41.980	57418.21			152037.74			336.26		47804 21	
440	3400	0.643	8.330			9	170	7.50	2.50	13.200	160.00			14994.72					4648 36	
Total.	44000		8.330								256460.76			362807.64		6430.57	668.30	9900	149566 87	

Average haul on Village Line, 550 feet.

* This 875 new series by Westfield Village, or 865½ same series by the north side of the River.

B LENGTH AND ESTIMATED COST OF PARTS OF ROUTES.

DESIGNATION.	TERMINI.	Length Miles.	Amount of each part.	Am't of parts forming a continuous Route.	Am. of each continuous Route thus formed.	Total length of each Route.	REMARKS.
Garden Brook Route.	From Stony hill to Sta. 445¼.	14.071	248416.21	248416.21	354433 89	22.196	
do. do. do. by Westfield Vil.	From Sta. 445¼ to west end.	8.125	116017 68	116017.68			
End Brook Route.	From Stony hill to Sta. 198¼ of Garden Brook Route.	9.631	175589 64	175589.64	291440 77	22.257	
Garden Brook Route.	From Sta. 198¼ to west end by north side of Westfield Riv.	12.626	115851 13	115851.13			
End Brook Route.	From Stony hill to Sta. 198¼ of Garden Brook Route.	9.631	175589 64	175589.64			
Garden Brook Route.	From Sta. 198¼ 445¼.	4.686	56051 84	56051.84	337659 16	22.442	
Westfield Village Route.	From 445¼ to west end.	8.125	106017 68	106017.68			
Mill River Route.	From Stony hill to Sta. 108 Garden Brook Route.	8.330	149566 07	149566.07			
Garden Brook Route.	From 108 to west end, north side of Westfield River.	14.349	169965 54	169965.54	319531 61	22.679	
Mill River Route.	From Stony hill to 108 Garden Brook Route.	8.330	149566 07	149566.07			
Garden Brook Route.	From 108 to 445¼.	6.233	110167 25	110167.25			
Westfield Village Route.	From 445¼ of Garden Brook Route to west end.	8.125	106017 68	106017.68	365751 00	22.688	
End Brook Route.	From Stony hill to Sta. 398.	7.538	96619 52	96619.52			
Cross Route to Bush's Notch.	From 398 End Brook Route to 604 Cabotville Route.	5.436	156406 17	156406.17			
Cabotville Route.	From Sta. 604 to west end.	7.877	133933 27	133933.27	386958 96	20.851	
Garden Brook Route.	From Stony hill to east bank of Con. River.	7.630	138249 96				
do. do. do.	From east bank of Con. River to west end.	14.346	169965 54				
Cabotville Route.	From Stony hill to east bank of Con. River.	7.872	79319 65				
do. do.	From east bank of Con. River to west end.	11.444	310693 59				
End Brook Route.	From Stony hill to east bank of Con. River.	8.589	134350 50				
Garden Brook Route.	From Stony hill to Sta. 198¼, end of End Brook Route.	9.390	192364 37				
Cost of Bridge on Garden Brook Route across Con. River.			46292 00				Admitting the same grades on this, as on End B. Route to same point, estim. cost will be reduced at least $30,000—E. B. R. is .241 of a mile longest.
Cost of B. on Cab. R. across C. R., (50 ft. above surf. of water.)			60793 63				
Cost of Bridge on End Brook Route, across Con. River.			37341 50				

RECAPITULATION.

ROUTES.	Elev. of ground at S. hill ab. Con. River Bench.	Elev. of Grade at do. ab. Con. R. Bench.	Elev. of gro. at W. ter. mination ab. Ct. R. Bench.	Ele. gra. at do. ab. do.	GRADES. 0 to 0 ft.	0 to 10	10 to 20	20 to 30	30 to 40	40 to 50	50 to 60	60 to 70	70 to 80	80 to 90	Total length. Miles.	Cost of Grading and Bridging.	REMARKS.
No. 1. Gar. Brook & N. W. R.	195	177½	197.462	181	3.054	7.973	2.277	3.447	2.159	3.106	"	"	"	"	22.016	308215 50	Total with 2d Gr. down Gar. Brook $274,425.46. With bridge 30 ft. 422,060.40. Total with 2d G. down Garden Brook, $320,641.55.
No. 2. Cabotville.	195	183	197.462	181	2.196	2 263	2.678	2.858	1.116	5.895	0.265	"	2.045	"	19.316	450806 87	
No. 3. Gar. B. and Westf. vil.	195	177½	197.462	170	2.447	7.732	3.892	5.019	"	3.106	"	"	"	"	22.196	354433 89	
No. 4. End B. & N. of W. R.	195	183	197.462	181	1.993	8.030	4.077	2.722	3.541	"	1.894	"	"	"	22.257	291440 77	
No. 5. do. & Westfield vil.	195	183	197.462	170	1.387	7.788	5.697	4.294	1.382	"	1.894	"	"	"	22.442	337659 16	
No. 6. Mill R. & N. of W. R.	202½	177½	197.462	181	3.508	6.240	2.798	5.616	3.731	0.777	"	"	"	"	22.679	319531 61	
No. 7. do. & Westfield vil.	202½	177½	197.462	170	2.902	5.828	4.422	7.187	1.572	0.777	"	"	"	"	22.688	365751 00	
No. 8. End Br. and Bush's N.	195	183	197.462	181	"	3.778	4.593	1.610	2.765	3.068	3.037	"	"	"	20.851	386958 96	

C Table exhibiting the Radius of Curvature, and aggregate length of Curves in each Route, from Stony Hill to Tekoa Mountain.

From Station	To Station.	Rad. Feet	Cur. Feet.	From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
Stebbins's	Childe's						
L. 2858	L. 14	3820	1800	664½	681½	2865	1700
92	107	5730	1500	722½	740½	5730	1800
122	163	5730	4100	743½	761½	2865	1500
206	216½	2865	1050	783½	793½	1432½	1000
234½	239	2865	450	793½	804½	2865	1100
250	263½	2865	1250	804½	814	1146	950
263½	270½	1432½	700	814	827	1432½	1300
270½	294	2292	2350	827	833	1910	600
294	324	1432½	3000	833	845	2865	1200
372½	381	1910	850	845	858	2292	1300
381	409½	*1146	2850	862½	865½	2292	300
409½	428½	16371	1875				
442½	449½	3820	650				
468½	480½	2292	1200	258	276	11460	1800
480½	496½	5730	1600	350	365	11460	1500
439½	571½	5730	3200	369	393	3820	2400

No. 2. By Cabotville.

From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
394	406	7640	1200
427	435	5730	800
513	552	5730	3900
552	569	3820	1700
582	612	2865	3000
612	635	1910	2300
734	741	11460	700
731	834	5730	300
906	921	2865	1500
934	939	5730	500
939	954	2865	1500
954	814	1146	1375
814	827	1432½	1300
827	833	1910	600
833	845	2865	1200
845	858	2292	1300
862½	865½	2292	300

No. 3. By End Brook to 198.86 Gar. Brook Line.

From Sta.	To Sta	Rad. Feet.	Cur. Feet.
275	295	5730	2000
316	327	5730	1100
338	344	5730	600
349	363	1910	1400
363	372	1432½	900
376	422	2865	4600
422	448	3820	2600
497	*570	1637.1	1000

* Joins 198.86 of Garden Brook Line.

No. 4 From 445 1-4 of Gar. Br. Line by Westefild vil.

From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
465½	473½	2865	775
476	480	2865	400
433	441½	3820	850

No. 5. From 398 or 26 of End Brook to Bush's notch

From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
574½	584½	3820	1000
611½	644½	5730	3300
644½	682¾	5730	3800
682½	700½	5730	1800
728½	757½	5730	2900
764½	772½	5730	800
793½	806½	1910	1300
816½	822½	1910	600
822½	835½	1637.1	1325
835½	841½	2865	600
861½	875	2865	1350
109	141	1637.1	3200
146	157½	5730	1150
174	198	3820	2400

From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
269	306*	2865	3700

* Near 604 of Cabotville Line.

No. 6. To Springfield by Mill River.

From Sta.	To Sta.	Rad. Feet.	Cur. Feet.
0	28	5730	2800
209	247½	11460	2850
257	271	5730	1400
310	323	5730	1300
323	330	5730	700
330	340	5730	1000
355	378	1432½	2300
390	412	11460	2200
420	440*	3968	2000

* Near 107 of Garden Brook Line.

RECAPITULATION.

NUMBER OF ROUTE.	Rad. 1146	Rad. 1432½	Rad. 1637.1	Rad. 1910	Rad. 2292	Rad. 2865	Rad. 3820	Rad. 5730	Rad 7640	Rad. 11460	Rad. 3268
No. 1. By Garden Brook.	3800	6000	1875	1450	5450	8250	2450	12200	"	"	"
No. 2. By Cabotville.	1375	1300	"	2900	1600	7200	4100	5500	1200	4000	"
No. 3. By End Br to 198, 86 of G. B. Line.	"	900	1000	1400	"	4600	2600	3700	"	"	"
No. 4. From 445½ G. Br. Line by West. vil.	"		1325	1900	"	3125	1850	15600	"	"	"
No. 5. From 398 or 26 of E. Br. Line to Bush's Notch.	"		3200	"	"	3700	2400	1150	"	"	"
No. 6. To Springfield by Mill River.	"	2300		"	"	"	"	7200	"	5150	2000

REPORT

UPON THE

RECONNOISSANCE AROUND THE NORTH END OF MOUNT TOM.

Worcester, March 16th, 1837.

To the President and Directors of the Western Rail Road Corporation.

Gentlemen,

I have the honor to state, that in obedience to the Resolution of the Board of the 21st January, directing the Engineers "to take a view of the route around the north end of Mount Tom," an examination has been made, commencing at a point at which it is probable the route would diverge from the present line, and terminating at the point farthest west, at which it is supposed it can reunite. These two points are the Wilbraham mountain (or Twelve Mile Brook) and Tekoa mountain in Montgomery.

From the Wilbraham mountain, or from Twelve Mile Brook (10 miles east of Connecticut River) the country in the direction of Mount Tom is generally similar in character to that between the Wilbraham mountain and Springfield village—it is in fact a continuation of the same sand plain, with the exception that it is rather more broken in appearance—hence it may easily be conceived that no serious obstacle would be encountered by the Rail Road in its passage across to the Connecticut River, in the direction referred to.

Having reached the valley of the river, by means to be suggested hereafter, the route would cross the stream in the vicinity of the Rock Ferry, at the north end of Mount Tom, thence by the base of this mountain, it would, at the distance of less than two miles, fall into the valley of Manhan

Creek, a stream which flows through the north west corner of the town of Westfield, and enters the Connecticut near the line between Easthampton and Northampton, and a short distance above Mount Tom. Pursuing this valley in a south west direction through Easthampton, Southampton, and the corner of Westfield, it would curve to the west and enter the valley of the Westfield River at Tekoa mountain, the point at which the Cabotville and Springfield lines now unite—

Such probably would be the best general direction for the route indicated in the resolution of the Board; from the character of the country east of the Wilbraham mountain, it is not to be expected that any feasible line could be found *farther* east than Twelve Mile Brook. For the same reason there is no probability that the line can be carried west of Tekoa, previous to uniting it with the Westfield river route. We may therefore fix upon these two points as the beginning and the termination of the route by Mount Tom.

The details of the route may be briefly stated thus: The line after leaving the Twelve Mile Brook, would cross the Chickopee River into the town of Ludlow, and from thence towards Deacon Dutton's, thence about 1 mile south west of Ludlow meeting house and $2\frac{1}{2}$ miles north of Jenks', or the Ludlow factories, thence crossing the small stream upon which the Continental saw-mill is situated, it would follow the plain at the base of the elevated ground in the western part of Ludlow near John Moody's, thence over very favorable ground through the north east corner of the town of Springfield, through the south west part of Granby, and thence into the town of South Hadley.

After reaching South Hadley, the question arises, whether the descent to the Connecticut River can best be effected by falling into the valley of Stony Brook, (called Muddy Brook upon the map,) upon which South Hadley village is situated, or whether it would be better to descend by the river bank some distance south of the village; or again, as Stony Brook, near its mouth, is crooked, whether it would not be better to pass over into the valley of Batcheller's Brook, a small stream which enters the river a short distance above Stony Brook; either of these routes seem to be practicable, but surveys alone could furnish the necessary data for determining which would be the preferable course. The

river at the Rock Ferry is narrow, probably not more than two-thirds the width it has at Springfield village: the approach to the crossing place being from the south, it might necessitate at this point rather an abrupt curve; but that, of course, would constitute one of the considerations which would govern in selecting the route from the high ground to the river. From the west bank of the river, the route would pass over favorable ground around the north end of Mount Tom, and in a distance of less than 2 miles, would fall into the valley of Manhan Creek, between 3 and 4 miles south of Northampton village. Four miles from the Rock Ferry, the route would pass the village of Easthampton, pursuing the general direction of the Hampshire and Hampden canal, which is located through the valley of the Manhan. From Easthampton to Southampton, 4 miles, the line would still pursue this valley, and continue in it to the Westfield boundary line, about 2¼ or 3 miles, thence leaving the Manhan, it would wind around the point of high ground which is connected with Tekoa, following the direction of the canal feeder from the Westfield River, and finally unite with the present route, as has been stated, at the junction of the Cabotville and Springfield lines at Tekoa Mountain.

TABLE OF DISTANCES BY MOUNT TOM.

		Miles.
Twelve Mile Brook to	Deacon Dutton's,	3
	South Hadley,	9
	Rock Ferry,	2
	East Hampton,	4
	South Hampton,	4
	Tekoa Mountain,	7
	Total,	29

TABLE OF DISTANCES BY SPRINGFIELD VILLAGE.

		Miles.
Twelve Mile Brook to	Stony Hill,	2
	Tekoa Mountain,	21
	Total,	23

The distances given in the above Table, by Mount Tom, were not measured, but are, as far as Southampton, (22

miles from Twelve Mile Brook,) believed to be nearly correct, as they were corroborated by different individuals along the line. The distance from Southampton to Tekoa is not stated with the same degree of confidence; it was taken from the town map.

It was not deemed necessary to make any examinations for a route between the Cabotville line and that just described, for it would evidently be longer; the only object in such a case would be to comply with the terms of the charter, requiring the road to cross the Connecticut River in the town of Springfield.

Respectfully submitted,

W. H. SWIFT, Resident Engineer.

REPORT

UPON THE

SURVEYS BETWEEN CONNECTICUT RIVER AND THE WESTERN BOUNDARY OF THE STATE.

Springfield, June 12th, 1837.

To the President and Directors of the Western Rail Road Corporation.

Gentlemen,

In pursuance of the order of the Board, of 21st January last, the line from the point of termination of the First Division in East Brookfield, to Stony hill in Wilbraham, has been located. With the exception of such improvements, at particular portions of the line, as might be anticipated from a thorough revision of the whole, it corresponds, generally, in its essential points, with the route approximately located, and described in the Report to the Board of the 15th January last, and in lieu of recapitulating the details of the route, we would refer to the above mentioned report, and to the accompanying Maps and Profiles, for such information, in reference to the same, as may be desired. There are two points, however, upon the route, at which the line is not definitively located, and as the selection will depend, ultimately, upon the results to be furnished by surveys now in progress, the question cannot, at this time, be determined. One of the points referred to, is at the Brookfield meadows, and the other is in the vicinity of Warren village. The modifications are proposed, with a view to the saving of expense in the cost of construction. In the former case, the line in its present situation, fulfills the condition required for a perfect road, being for a distance of 2 miles, both straight and level. But the question arising in our minds, whether it would be attainable within

reasonable limits, compared with the cost of constructing the line which we propose to substitute for it, we were unwilling, without the fullest investigation, to incur an expense which the circumstances of the case might not justify, and without all the facts, it would be premature to attempt to decide correctly upon it.

By the order of the Board of 22d of March, that portion of the line between Stony hill in Wilbraham and Armory Street in Springfield, was ordered to be located, and from Armory street to a point on the west side of Connecticut river, lines were directed to be approximately located, on both sides of the Garden brook. In accordance with these instructions, the duties enjoined therein have been performed, a very favorable location has been made across the plain from Stony hill to the head of Garden brook; and from thence to a point one mile west of Connecticut river, four distinct lines have been approximately located. These lines cross the river between the present bridge and Ferry Street, embracing an extent north and south, of about 1600 feet. They are about three miles in length, and so similar in character, that it will be necessary to describe them rather minutely, to enable the Board to judge of their respective merits. For the sake of perspicuity we number these several lines, 1, 2, 3, and 4.

No. 1. Commencing in the valley of Garden brook, at a point 3000 feet east of Armory Street, the southern line deflects to the south 2° in a distance of 400 feet upon a curve of 2 miles radius; thence by a tangent of 200 feet, thence it deflects to the north 15° in a distance of 3000 feet upon a curve of 2 miles radius. The western end of this curve being 300 feet from the river bank, thence by a straight line 1550 feet to the west bank of the river, thence curving to the north 63° 30′, in a distance of 4200 feet upon a radius of 3820 feet, it unites by a straight line of 1600 feet with the northern line, or Route No. 4. Line No. 1 crosses the river 330 feet above the bridge, and at the Worthington lot, so called.

No. 2. Passing north, the second line in succession, crosses the river 800 feet above the bridge, at Dr. Osgood's lot. It is straight from the point 3000 feet east of Armory Street, to the west bank of the river, a distance of 10,500 feet; thence it deflects 66° 58′ to the north, in a distance

of 4100 feet, upon a curve of 3509 feet radius, and there unites with line No. 1.

No. 3. The third line in succession, is a tangent to the curve at a point 3080 feet east of Armory Street, and from its origin, it is also straight to the west bank of the river, 10,580 feet, thence it deflects 66° to the north in a distance of 4400 feet, on a radius of 3820 feet, and there unites with Route No. 1. This line crosses the river at Mr. Hooker's lot, 1050 feet above the bridge.

No. 4. The fourth or northern, deflects from the main line, 3380 feet east of Armory Street, thence it is straight 3900 feet; thence it deflects 3° 30′ in a distance of 700 feet, upon a curve of 2 miles radius, thence it is straight 7500 feet to the west bank of the river, thence it deflects 62° 40′ to the north upon a curve of 4700 feet in length, and of 4298 feet radius, and there unites with line No. 1. This line crosses the river at Mr. Brewer's lot, and is about 1500 feet above the bridge, or 100 feet below Ferry Street.

No. 5. In addition to the above routes, a line was traced from the Garden Brook route, to a point in State Street, with the view of establishing a passenger depot, at or in the vicinity of that point.

The computations of both the distance and the cost of line No. 5, are made from the point at which this route departs from No. 1, to its junction with the same again, east of Main Street. The amount is, of course, to be added to the cost of either of the lines across the river, which may be adopted for the route. The propositions of the several proprietors of the lots offered for a depot, have been made upon the supposition that both the passenger and freight depots would be established upon their grounds. If either were to be placed elsewhere, their terms, of course, would be less advantageous.

The length of the line from its departure from Route No. 1 to State Street, is 4050 feet—of which 2725 feet is composed of curves of 1350 and 800 feet radius, respectively; and the balance of 1325 feet of straight line.

Cost of grading the same - - -	$5568 70
Superstructure, (Bar iron) - - -	2673 12
Cost of Land damages and ground for depot near Main Street - - -	12,550 00
If the depot were established farther north, say opposite Court Square, for land damages and depot	$7750 00

This line will be recognized by the Board, as the route proposed for their consideration by Henry Sterns, Esq., and by them ordered to be examined.

The following summary will exhibit a comparative view of these several routes, embracing the length, curvature, grading, bridging, land damages, cost, &c. of each. The land damages, including ground for a depot, have been furnished by the Agent of the Corporation; and his report upon that subject, now in possession of the Board, will have presented a full statement of the propositions of the different land owners through whose grounds the lines pass.

Summary of Routes from station 665, (a point below the head of Garden Brook,) to a point on West Springfield plain, one mile west of the bridge.

Statements.	No. 1.	No. 2.	No. 3.	No. 4.
Length of line (feet).	16.625	16375.	16172.	15800.
Grade (Maximum).	50.68	50.68	50.68	50.68
Aggregate length of curves (feet).	9825.	4450.	4400.	6000.
Total deflection in degrees.	91° 30′	68° 34′	66° 00′	66° 10′
Width of Con. River (feet).	1195.	1228	1259.	1335.
Greatest depth (feet).	14½	15.	13½	14
Mean depth (feet).	11.45	11.80	10.27	10.19
Angle of axis of bridge with that of river.	83° 30′	82° 43′	80° 52′	72° 45′
Grading.	19472.34	20662.00	21981.84	22499.40
Land damages, including ground for depot.	10570,00	14072,00	6245,00	7592,00
Connecticut River Bridge.	60984,00	62743,00	62484,00	62477,00
Total cost.	90826,30	97477,00	90710,00	92568,00

So far as we may be called upon to express an opinion in reference to a position for the depot, which shall best subserve the interests of the Corporation, we think we shall have performed our duty in that respect, when we say that a piece of ground of about 3 acres in extent, will be required, as nearly upon a level as may be; or where the grade of the road shall be sufficiently light to prevent the spontaneous descent of the trains—that it be established upon a portion of the track which shall be free from abrupt curvature, and that the lot of ground shall be about twice the length in the direction of the road, that it may be

transversely to the same. This being necessary to facilitate the entrance to such branches and sidelings, as may be required through the depot yard.

By the farther order of the Board, of the 22d of March, as indicated in the letter of instructions of the President, of the 25th of March, the road from East Brookfield to the Connecticut River was directed to be prepared and offered for contract, with the condition that the line should follow, either the north, or the south side of Garden Brook, as the Board might deem it expedient, to select the one or the other, for the route. In conformity thereto, this portion of it was advertised on the 1st of April, and the period specified for receiving proposals was limited to the 10th May; but it having been considered advisable to extend that limit, the contractors were notified that the allotment of the work would be postponed until the 1st June. Upwards of 500 propositions have been received from between 60 and 70 contractors; and those proposals which accorded best with the interests of the Corporation, have been accepted. Upon the two largest sections, where there was doubt as to the character of the excavation, the ground has been bored to a point below the grade of the road. These two sections are not yet allotted, being still under consideration.

We now proceed to the description of the operations on the west side of Connecticut river, and between it and the New York line. At the date of the last Report, the northern route, only, as was then stated, had been approximately located; and although numerous experimental lines had been surveyed upon the south route, no one line had been more critically examined, for location, than another. There was so much more space to be traversed by the preliminary surveys, than upon the north route, that the time consumed did not admit of locating. Since that period, this object has been attained, and thereby we have the means of making a full comparison of these two routes. In order to do this, it will be necessary to assume some point near the Connecticut river, which shall be common to both lines, and refer all the comparisons to it. For this purpose we shall take the east bank of the river, and compute the distance from it. The heights are all referred to the Bench Mark, at the eastern abutment of the bridge, being about 20 feet above the ordinary low water in the river.

It is well known that the Connecticut river is separated from the Hudson by an elevated range of mountains, which traverse the intermediate country from north to south; and further, that the waters of the Housatonic are divided from those of the Connecticut, by a lofty spur of the same range. This spur deflects from the parent chain, north of the source of the Housatonic river. Its course is east of south, or transverse to the route of the Rail Road.

This range has been examined from Washington on the north, through Becket and Otis, to Tolland on the south, embracing an extent of 22 miles from S. S. E. to N. N. W. By this examination we find the following to be the most favorable depressions for passing the main dividing ridge.

The Washington summit, elevated 1419 feet above the Bench Mark at Connecticut river, (20 feet above ordinary low water.)

The Spruce swamp summit, near the line between Otis and Blandford, is 1470 feet do.

Lyon's summit, in Otis, at the head of the north branch of Westfield Little river, 1484 feet do.

The Tolland summit, near Noyes's pond, 1392 feet do.

Having thus ascertained the heights of these several summits, the next question which presents itself for determination, is the route by which this elevation is to be overcome to the best advantage. We might premise, that by introducing a system of inclined planes, much distance would be saved; but knowing the strong objections which prevail in the community against their use, we have conceived it expedient to direct our attention to such other routes only, as would admit of the application of locomotive power.

Referring to a map of the State, it will be seen that the Westfield river, the Farmington river, and the Housatonic, mutually interlock their branches with each other. The western termination of the Western Rail Road being upon a tributary of the last-mentioned stream, and the intermediate summits being determined, it becomes the question then simply to select the most feasible route from one valley to the other. The Westfield, or Agawam river, is composed of two principal branches, called the Great and Little Westfield. The source of that branch of the former, which rises farthest west, is in Washington, while the Little West-

field has two branches, which rise at about the same distance west, viz. the northern near Lyon's, in Otis, and the southern at the Spruce swamp, near the Otis and Blandford line. The routes which have been surveyed, and approximately located for the north line are by Westfield Great river, and those for the south line, are by the valleys of both branches of the Little Westfield, and by routes entirely south of the same. To this general description, we may add the following statement: a straight line from Springfield to the western termination of the Rail Road, at the N. W. corner of West Stockbridge, passes through West Springfield, Westfield, southern part of Montgomery, northern part of Blandford, near the middle of Becket, middle of Lee, north part of Stockbridge, and of West Stockbridge. The distance is about 47 miles; the distance by the shortest travelled road, is about 50 miles. The greatest northing which the north route makes, is in Dalton, 9½ miles from the straight line; the greatest southing which the south route makes, is in Southwick; but its greatest *distance* from the direct line is at Tolland, being at that point 8 miles from it. The lines, (north and south,) are farthest apart near the middle of the route, say at S. E. corner of Chester and N. W. corner of Tolland, 12 miles. We now proceed to the description of the lines which have been approximately located, both upon the north and south routes.

It has been stated in another part of this Report, that the four lines through the valley of Garden Brook, in their prolongation to the west, unite at a point about one mile from the river, on the West Springfield plain. From this point to Morley's bridge, across the Agawam river, a distance of 5 miles, the north and south routes are common to each other. Falling upon the Westfield river, at Ashley's mill, they continue at the margin of the stream two miles, and in a direction nearly west, to Tatham hill; thence curving to N. W. and again to west, they reach Morley's bridge. Throughout this distance, with the exception of some side cutting in red sand stone, at the Midneag falls, the ground is favorable, and not such as would be called difficult, even, at the falls. From this bridge, two lines were surveyed for the north route—one passing entirely north of the Westfield river, and crossing the Hampshire and Hampden canal at

Sackett's, and from thence to a point one mile above Tekoa mountain, and 8 miles west of Morley's bridge—the other crosses the Great and Little Westfield river, passes through the village of Westfield, a little south of the common or public square; thence by the south side of the low grounds of the Westfield river by Phelps's and by Clark's tavern, and crossing the river near widow Palmer's; it unites with the line by the north side of the river, near S. Bronson's, one mile above Tekoa mountain, as was stated in the Report of 15th January last.

Referring to that Report for a description of the several experimental lines which were surveyed for the south route, and numbered from 1 to 13, inclusively, we pass on to detail the route selected from among them for approximate location, with the introduction of such amendments of different portions of the same, as suggested themselves in the course of the re-examination.

From the village of Westfield, the south route passes over the plain to the Little Westfield, at the Powder mill, two miles distant, and crosses the river at that point; thence it curves gradually to the south, towards the valley of Munn's brook, (a branch of the Little Westfield) and crosses it below I. Shepard's; from thence, it turns farther south, and ascending the eastern slope of Sodom mountain, at a grade of 56 feet per mile, it enters the N. W. corner of Southwick; thence increasing the grade to 79.6 feet it pursues a course nearly south, to Loomis' gap (a depression in Sodom mountain formed by a branch of Munn's brook) 4 miles from the Powder mill; thence winding into this gap upon a curve of 1000 feet radius, it turns to N. W. and follows the direction of the valley of this branch to Farnsworth's; turning still farther to the north, it enters the S. W. corner of Westfield at Mount Pisgah, 3½ miles from Loomis' gap, from Mount Pisgah it turns to the west, and again south, and enters the town of Granville; here it falls into the southern part of the valley of the Little Westfield, and continues parallel to it, near the Russell line, as far as Cobble mountain, on the east side of Stowe's brook, and 3 miles west of Mount Pisgah. At this point, the grade is 85 feet below the surface, and the excavation being in rock, a tunnel of about 600 feet would probably be preferable to a thorough cut. Crossing the deep ravine made by Stowe's brook, at an elevation above the

surface of the water of the same, of about 100 feet, the grade is reduced to 54 feet, thence it curves to the south, leaving the valley of the river, but turning soon to north again, to avoid the high ground west of Stowe's house, it crosses the Blandford line, and approaches the river again opposite Rowland Noble's at the junction of the north and south branches, and 1½ miles N. W. of Stowe's. From thence to Beech hill, 2½ miles, it winds along the side hill, crossing occasionally the line between Granville and Blandford, and crossing also the south branch of the Little Westfield, called Peeble's brook, the grade is here increased again to 80 feet, and the line is thrown from its west course at Ripley's, to one due south, to turn the point of Beech hill, and after passing this hill, it turns to N. W. and pursues that course 4 miles to the Spruce swamp summit, near the Otis and Blandford line, crossing the N. E. corner of Tolland. This is the principal summit of the route. It is elevated 1470 feet above the Connecticut river Bench Mark, and about 30 miles distant from it. An uniform ascent would give a grade of about 49 feet.

From the summit to Green Water pond in Becket, 11 miles, the line is very favorable, both in its direction and in its grades. It descends to Baird's tavern, near Nichols's pond, at inclinations varying from 2 to 28 feet per mile, and over a surface easily graded. At one mile west of the summit it passes through the village of East Otis; crossing at that place the outlet of Great pond, a tributary of Farmington river; thence by Parish pond, (the source of Farmington river,) and by Esq. Filley's, to Nichols's pond, in the southwest corner of Becket; from thence, to Green Water pond, the line ascends 8 feet per mile over favorable ground.

Green Water pond discharges itself into the Housatonic river in the town of Lee, through Green Water pond brook. This pond is the summit between the Farmington and Housatonic. The descent to the west from this summit is 79 feet per mile, through the valley of the outlet of the Green Water pond. The line crosses the ravine of this brook, below Sturgis's tavern, at an elevation of upwards of 100 feet above the surface of the water, and 5 miles distant from the pond; thence it winds to the S. E. around the point of East mountain, into the valley of Hop brook, crossing this stream in the N. W. corner of Tyringham, and

about a mile above its junction with the Housatonic and 3 miles south of Green Water brook, still descending 79 feet per mile ; thence it is level $\frac{1}{8}$ of a mile ; and thence the line, as approximately located, passes over a slight summit, but this may be avoided by pushing it a little farther north, or even crossing the river at South Lee, instead of the present crossing place, in the eastern part of Stockbridge.

From the present crossing place, one mile west of the boundary line between Lee and Stockbridge, the route passes over Stockbridge plain, north of the main street, and from thence to Fueri's at the rocky ridge which separates the Housatonic from Williams's river (one of its branches) the line is nearly straight, crossing a bend of the river twice, to avoid a great curve to the north. But from Stockbridge plain to this summit, the line is both difficult and expensive, it crosses the river, necessarily, at heights of 25 and 40 feet respectively, and ascends at a grade of 55 feet per mile.— Near Fueri's, 4 miles from the first crossing place of the Housatonic, in the eastern part of Stockbridge, the line enters the town of West Stockbridge ; and to pass through the gap at Fueri's, two curves of 1000 feet radius each, are necessary. From this summit the line turns north, and following the side hill at grades descending to the west, of 38 feet, 20 feet and 7 feet per mile, it falls into the valley of Williams's river, and unites with the West Stockbridge Rail Road, at the proposed depot of the same, in the village of West Stockbridge, $2\frac{1}{4}$ miles east of the New York state line. From the depot west, the route pursues the located line of the West Stockbridge Rail Road very nearly, and joins the Hudson and Berkshire Rail Road at the state line, 62.38 miles from Connecticut river.

For a full description of the details of the route, embracing the grades, cuttings, fillings, curves, &c. reference is respectfully made to the accompanying Maps, Profiles, and Tables, and to the descriptive memoir of Mr. Morgan, appended hereto, under whose immediate direction, the approximate location, and a great portion of the preliminary surveys were made. An inspection of these maps, upon which all the lines are delineated, will bear us out in the assertion, that very extensive examinations have been made in reference to a "South Route." The results furnished by the same are now before the Board. They contain, we

believe, all the facts necessary to be considered, in comparing this route with the northern or Pittsfield route. We now proceed to a description of the same.

NORTHERN ROUTE.

This route is, essentially, the same which Mr. Baldwin surveyed for a Rail Road, in 1828, viz. by the valley of the Great Westfield river, and by one of its branches to the source of the same in Washington, thence by the principal branch of the Housatonic river to Pittsfield, and thence by a smaller branch of the same to a summit between the Housatonic proper, and Williams's river, one of its tributaries, thence to the N. York state line, at West Stockbridge.

From the junction, on the north side of the river, at S. Brunson's, of the two lines by the north and south sides of the Westfield, one mile above Tekoa mountain, and 14.30 miles west of the Connecticut, the route continues on the north side, one mile beyond, to a very abrupt bend of the river at Capt. Bronson's, necessitating at that point curves of either 1000 or of 800 feet radius as the line shall be thrown more or less into the bend of the river. The pass is a difficult one, and without encroaching upon the stream, or cutting off the bend entirely, by two bridges very oblique to the course of the river, the curve would be of too short a radius to be admissible. The grade is light, being about 15 feet per mile. From Capt. Bronson's to Finney's at the 2d mile, (counting from the junction of the two routes at S. Bronson's) the line follows the base of the east point of Shatterack mountain, a high rocky promontory, passing, in its course, over spurs, and intervening ravines, with a succession of curves, reversing from one to another, and not to be avoided without unwarrantable expense in the cost of construction. Near Finney's, the line crosses to the south side of the river at the "Narrows," to avoid the sharp turn which the stream makes, at Tuttle bend, 3¼ miles above Bronson's. By keeping the north side of the river at the bend, a curve of about 500 feet radius would be required. As it is, the alternative is to cross the river at the Narrows, upon a curve of 1900 feet radius, and continue upon the south side, at the foot of Tuttle mountain, and near the stream, re-crossing at the west point of Shatterack mountain, 500 feet above the east-

ern extremity of Tuttle bend. To accomplish this, even, compels the introduction of a curve of 955 feet radius. Immediately after crossing the river, at Tuttle bend, it becomes unavoidable to reverse the curve to one of the same radius, to turn the point of a lofty spur, which protrudes itself to the south. This done, the line falls upon the margin of the stream, at 3¾ miles, and continues to pursue it, to a point near Gould's mill, at 4¾ miles.

An attempt was made to obviate some of the above difficulties, by passing through the depression, south of Tuttle mountain, by the route of the present Albany turnpike, near Hawley's tavern; but it was found to be 105 feet above the river at the Narrows, in a less distance than ¾ of a mile.

From a point below Gould's mill to Chester village, at 6½ miles, two routes were located, one on the north, and the other on the south side of the river. The line by the south side is the best and shortest. The grade and curves are also better. It will, by the estimate annexed hereto, cost $5,900 more than that on the north side. This is caused by a single deep cut, and the expense of preserving the turnpike road. Uniting at Chester village, the route pursues the south side of the river to Porter's, at the 11 mile mark. The ground is very favorable, and the grades 31 and 33 feet respectively. The curves too, are comparatively easy. The line as at present located, crosses the river at Porter's, near the 11 mile mark, and again to the south side, at Wilcox's mill pond, near the 11½ mile. This was done to cut off the bend of the river between these two points. Both these crossings may be avoided, by cutting through the rocky point of the mountain, which pushes itself down to the margin of the river, on the south side, between Porter's and Wilcox's. Previous to a definitive location, this line would, of course, be traced, and the comparative cost ascertained. The grade thus far has not exceeded 33 feet.

From Wilcox's pond to Fay's mill, the grade is increased to 41 feet, the line pursues the foot of the hill, and passing north of the old glass-house, it crosses the river between this latter point, and N. Root's, a short distance below Hubbard's tavern, at the mouth of Walker's brook, in Chester. At Fay's (13½ miles) the line recrosses to the south side, and the grade is raised to 71 feet, to correspond with the general declivity of the river. At 14½ miles above D.

Bigelow's, the line passes over again to the north side, continuing to ascend at the grade last mentioned (71 feet.)

From this crossing place, to M'Elwain's tavern in Middlefield, a distance of 6½ miles, is the most difficult and expensive portion of the route. The river is exceedingly crooked, and the mountains shut in on both sides, leaving scarcely room for a road, and requiring between Bigelow's and M'Elwain's, 15 crossings. The rocky points thrust themselves quite down to the stream, and no alternative is left, except a resort to very objectionable curvature, between these points. The grade here is also the steepest, viz. from 71 to 82 feet. At the curves of least radius, this has been reduced, to equalize, more nearly, the total resistance; still the far greater portion of the line must be laid at the grades specified above, for, notwithstanding the foot of the plane is elevated 48 feet above the river, yet the fall of the stream from McElwain's down, is so great that the line is now only 2½ feet, above the sill of his mill dam, a less grade, therefore, without a corresponding increase of curvature, cannot be attained.

An examination of the Maps and Profiles, will convey a better idea of this portion of the line than any description; and the memoir of Mr. Childe, in the Appendix to this Report, exhibits a statement of the obstacles to be encountered. By referring to the Map, it will be seen, that at Capt. Root's, (or Rhinoceros point, as it is called) that from the northern extremity of the mountain, at Root's, to Bigelow's, the course of the river is south; while from the western extremity of the bend to Root's, it is north, and that to turn this sharp point, a curve amounting nearly to a semicircle, upon a radius of about 1000 feet, is indispensable. The river in this part of its course, performs a circuit of two miles; and the distance across the peninsula (an immensely high mountain) is between one half, and three fourths of a mile, only.

From McElwain's tavern to the summit, at Sibley's, in Washington, 3½ miles, the line, after making a curve from west to nearly south, pursues a very direct course, at an inclination of 71 feet to the mile. The grading, in the last mile and a half, will be very expensive; the cut at the summit being 55 feet, and the filling on the east side of it 45 feet. Both these must be encountered, unless the curvature and grade be unwarrantably increased.

From the summit to Merriman's mill, or Plunket's factory, on a branch of the Housatonic river, in Hinsdale, and 5 miles from Sibley's, the line, as located, passes west of Mud pond, (the source of this branch of the Housatonic,) and thence by the valley of Hinsdale mill stream, to Capt. White's, through the Hinsdale meadows, from thence to Merriman's, over favorable ground. The grade within these 5 miles, in no case exceeds 22 feet, the greater part being nearly level. Before this part of the route is definitively located, it will be proper to examine a line, from the summit to Capt. White's, passing farther east, as represented upon the Map by a dotted line.

From Merriman's mill to Goodrich's, in Pittsfield, the first favorable point which occurs for crossing the Housatonic river, it is 5¼ miles. In this distance, the river descends 420 feet. The consequence, of course, is, that a steep grade, throughout this extent, must be resorted to. 1.89 miles is at 71.28 feet, and 3.48 miles is at 81.78. A heavy cut, involving the excavation of about 140,000 yards near the Hinsdale and Dalton boundary line, is the most serious obstacle in this portion of the route; and still this cannot be avoided without pursuing the immediate valley of the river from Merriman's, down, involving an increase of distance and of curvature. The grade would be diminished, but it is probable that the additional cost incurred by the increased distance, beyond the cost of making the cut at the town line, would reduce much of the advantage in this respect, which might be supposed would arise from thus extending the line. It will be proper, however, to have the river line traced, and the expense of a route in that direction ascertained before the line is adopted.

From Goodrich's to the village of Pittsfield, the line is very direct, with a slightly ascending grade. The surface is rather broken. It passes by Plunket's, and Munn's, the north side of ——— mill pond, and enters the village north of the Green or public square.

From Pittsfield to the New York line, the route is principally in the direction of the valley of a branch of the Housatonic, to a summit in Richmond, near Rev. Mr. Dwight's, and from thence to the Western termination, by a line rather transverse to the course of the streams, which fall into Williams' river, the branch of the Housatonic, up-

on which the village of West Stockbridge is situated. Between Pittsfield and the Richmond summit, two distinct routes have been approximately located. The first, or main line, as it is marked upon the Map, crosses the Pontoosuc near the head of Pomeroy's satinet factory pond; thence it crosses North run near N. Sturgis's, thence south of his house, it falls into the valley of the Shaker mill stream, at Goodrich's, thence crossing two intermediate bends of this stream, it reaches the same valley again at Sterns's factory, ascending at 51 feet per mile to the Shaker's mill, thence at a grade reduced to 9 feet, it crosses two other bends of the same stream, and the western part of ——— pond, at the line between Pittsfield and Richmond; thence by a branch falling into this pond, it ascends to the summit at Parsons's, east of Rev. Mr. Dwight's.

Passing the summit, the line crosses a branch of Williams's river three times, occasioning a succession of cutting and filling at the spurs, and intervening ravines. The last crossing of this stream is at a point where the meadow, through which it runs, is upwards of 2000 feet wide, north of Leadbeater's. At Leadbeater's, the line falls into the valley of another branch of Williams' river, thence by Col. Rowley's and north end of ——— mill pond, to Griffin's in West Stockbridge, near the Richmond line, thence turning to the west, it crosses a small branch, and winds around the slope of the high ground, thence south of Arnold's, and unites with the south route at the New York state line.

By examining the accompanying Table, it will be seen that the maximum grade upon the line west of Richmond summit is 55.84 feet for a distance of nearly two miles; but reducible most probably, by modifying the line, to 45 or 46 feet. Four and a half miles is from 41 to 45 feet, and the balance 4.80 miles is less than 14 feet. The entire distance from Pittsfield to the state line is about 11½ miles.

The second line from Pittsfield to the New York line crosses Pomeroy's factory pond, south of the main line, and thence turning farther west, it crosses the first line east of North run, and south of N. Sterns's, continuing nearly west, it unites with the main line, between Goodrich's and Sterns's factory. From the point of junction, another line was traced, which may be considered a continuation of the second line, passing farther north than the first or main

line, and nearer the Shaker village, thence S. W., until it united with the main line, near the Richmond summit. This line is made up of portions of three separate routes, marked A, B, and D upon the Map.

From Griffin's in Richmond, near the West Stockbridge and Richmond line, a route was traced to West Stockbridge village, about 1¼ miles.

The above lines for both the north and south routes, terminate at the West Stockbridge gap (so called;) a practicable line, it is said, may be found in Richmond across the dividing ridge between the waters of the Housatonic (or of Williams's river,) and of the Hudson, farther north than the Stockbridge gap. This information we gather from communications upon the subject, made to the agent of the Western Rail Road Corporation, by two gentlemen connected with the Albany and West Stockbridge Rail Road—one the superintendant, and the other a director.

They state that the gap at Richmond, as determined by the surveys of their Engineer, is 350 feet higher than that at West Stockbridge; and that it is about 3 miles north of the same; that the distance from the Rev. Mr. Dwight's (the summit of the Western Rail Road between Pittsfield and West Stockbridge) to this gap, is 3 miles, and that the inclination per mile from Mr. Dwight's to the summit, would not exceed 40 feet; that the distance saved between Connecticut river and Albany, if the north route should be adopted, would be 6 miles, making the distance from Richmond gap to Albany, 33½ miles, if the route by Lebanon Church should be taken, or if by Lebanon Springs, (1½ miles farther north,) 37½ miles; "that the route by the Springs," using the language of the superintendant, "being so much longer than that through the valley by the Church, admits of construction upon a grade of 40 feet to the mile, and less; but if that by the Church is adopted, the Church being 4½ miles from the summit at the pond, a grade of 72 feet per mile, or more, must be adopted to go up; and about the same grade will go over the Richmond summit when reduced by a liberal cut. The route up the Lebanon valley, by the Church, and thence by the steep ascent of 72 or 78 feet to Richmond, can be made at a great saving of expense to our company, compared with the route by the Springs, probably $100,000 and over."

How far these facts should weigh, in determining upon the main route west, is a question for the Board to decide. The information is embodied here, as we conceive it to be pertinent to the subject under consideration. We may farther mention that the grading of the Hudson and Berkshire Rail Road from West Stockbridge to Hudson, is stated to be three fourths completed; and that as yet, nothing has been done, in the way of construction, upon the Albany and Stockbridge road.

OF THE GRADES.

In order that a correct estimate may be formed of the difficulties to be encountered, in giving to either route grades which may be regarded as practicable for locomotive engines, it will be proper to bear in mind, that the entire line from Worcester to the N. York state line, must, of necessity, pass two very elevated summits, viz. that at Charlton, between the waters of the Connecticut, and those of the Blackstone, Quinebaug, &c. and the still more formidable one, which divides those of the Connecticut from the Hudson. Reviewing the line, we shall find that to overcome the Charlton summit, we have to ascend 470 feet in a distance of about 12 miles, and to cross the Connecticut river, (which at Springfield is only about 40 feet above tide water) it is necessary to descend in 42 miles, nearly 900 feet; thence again, to cross the mountain west of Connecticut river, we must ascend upwards of 1400 feet in 40 miles; and to reach the gap at West Stockbridge, we must descend again 600 feet in a distance of 23 miles.

Over such an extent of country, it would not, of course, be expected that, without resorting to inclined planes, and fixed engines, an uniform inclination, upon either side of these summits, could be obtained. In the absence of a system of planes, worked by stationary power, the fall of the several streams, which the routes pursue, determines the inclination or grade, to be given to the several stages of the road.

North Route. From Connecticut river to Hubbard's tavern, in Chester, the distance is 28 miles, and with the exception of 1.83 miles, at the western end, the grade does not exceed 33 feet. From Hubbard's to the summit at Sibley's, in Washington, 11 miles, the grade is from 70 to

82 feet, there being in this distance, but ¾ of a mile of a less grade than 55 feet.

From Sibley's to Merriman's mill, the distance is 4.65 miles; the highest grade is 22 feet, and the greater portion of it nearly level.

From Merriman's mill to the crossing of the Housatonic, at Goodrich's, in Pittsfield, the distance is 5.38 miles, with grades of 71.28 and 81.78, thence to New York line, it need not exceed 50 feet, and it may be, 45 feet.

South Route. From Connecticut river to Munn's brook, 11 miles, the grade need not exceed 33 feet. The first grade of 63 feet east of Munn's brook is to be avoided by winding around the point of the hill, near the mouth of the brook, instead of passing over it, as at present represented.

From Munn's brook to the Spruce swamp summit, 19.20 miles, the grades vary from a level to 80 feet per mile—10 miles being at 80 feet, and 3 at 70 feet. The balance of 6 miles varies from a level to 56 feet.

From Spruce swamp summit, west, to Green Water pond, 11.50 miles, the grade no where exceeds 28 feet and the greater part of it is less than 20 feet.

From Green Water pond to Hop brook valley, 6.65 miles, the grade is 79 feet.

From Hop brook to Stockbridge village, there is at present, a grade near South Lee, of 44 feet for 1 mile, but this may be avoided by throwing the line north, nearer the river.

From the village of Stockbridge to Fueri's summit, in West Stockbridge, 2.60 miles, the grade is 55.49 feet, thence to the New York line, nothing greater than 39 feet.

It results from the above, that if we fix upon 56 feet as a limit, that all the grades beyond that amount in the north line, are confined to the space between Hubbard's in Chester, and Goodrich's, at the crossing of the Housatonic, in Pittsfield, a distance of 21 miles, viz.

11	miles,	Hubbard's to Sibley's	from 71 to 82 feet.
4.65	"	Sibley's to Merriman's	Level to 22 feet.
5.38	"	Merriman's to Goodrich's	71 to 81.78 do.
21.03	"		

Upon the south route, we find the distance from the 1st grade exceeding 56 feet on the east, to the last on the west, to be 37 miles, thus,

19.20 miles, Munn's brook to Spruce swamp, Level to 80 ft.
11.50 " Spruce swamp to G. W. pond, Level to 28 ft.
6.65 " Green Water pond to Hop brook, 79.28 ft.
37.35

The consequence is, that, if it should be necessary to use an assistant engine, upon the steep grades, its operation, on the north route, might be confined to a distance of 21 miles, while on the south route, it would necessarily extend over a space of 37½ miles.

ESTIMATE OF THE COST OF CONSTRUCTION.

The computations for the estimate, have been made for a track of 20 feet in width, in the excavations, and for 16 feet at the embankments, with slopes of earth of 1½ to 1, and for rock, 1 to 5. Bridge abutments are calculated for a double track. We find, by the data assumed, that the cost of grading and bridging the north route will be $1,144,637.16, and for the south route $1,120,823.14.

To the above amount we add 10 per cent., not for contingencies, as they are generally considered in an estimate, but to enable us to meet *probable* difficulties. In such an extent of mountainous country, we must expect to encounter obstacles, not anticipated at this time, and to be discovered only as they develop themselves during the progress of the work. As a prominent item we may mention rock cutting. The precise amount of which, cannot, of course, without repeated borings, be estimated with any degree of accuracy. Upon the north line, and caused perhaps by the action of the river, a greater proportion discovers itself, than upon the south; but it does not follow that the actual difference would be so great, if as much of the nature of the cutting were exposed to view, upon the south line. Upon the north route, we have provided in the estimate for the excavation of 247,000 yards of rock, and 17,000 yards loose rock. Upon the south line, the estimated quantity is 137,000 yards rock, and 87,000 yards loose rock. This is a large amount certainly, but it is a mountainous region throughout a great portion of the route, and we think it safer to make the addition stated, to cover not only this, but other difficulties, not to be foreseen. Accordingly we state the cost of grading and bridging as follows:

South Route $1,232,905.45, or, per mile 19,762.21.
North Route $1,259,100.87, or, per mile 19,952.79.

Comparative view of North and South Routes.

STATEMENTS.	S. Route.	N. Route.	Difference
Distance from Ct. River to N. York line,	Ms. 62.438	63.104	0.666
Elevation of principal summit,	Ft. 1470	1419	51.0
Elevation of grade at do.	Ft 1440	1392	48.0
Number of summits,	5	4	1.
Total amt. of ascending grades fom east,	Ft. 1655	1542	113.0
Equated distance,	Ms. 149.543	144.263	5.280
Total deflection in degrees,	4931.5	4441.5	390.
Length of curved line,	Ms. 34.041	34.414	0.373
Length of straight line,	Ms. 28.397	28.690	0.293
Maximum grade,	Feet 80	82.18	2.18
Grades from 0 to 30 feet per mile,	" 31.490	33.483	1.993
" " 30 to 40 "	" 3.375	5.113	1.738
" " 40 to 50 "	" 1.061	6.382	5.321
" " 50 to 60 "	" 5.747	2.481	3.266
" " 60 to 70 "	" 4.090	0	4.090
" " 70 to 80 "	" 16.665	7.748	8.917
" " 80 to 82 "	" 0.	7.897	7.897
Total amount of grades above 71.57 ft.,	Ms. 16.665	8.902	7.763
Cost of grading and bridging per mile,	$17,965.65	18,138.90	173.25
Total cost of grading and bridging,	1,120,823.14	1,144,637.16	23,814.02
Add 10 per cent. to above cost of grading and bridging per mile,	19,762.21	19,952.79	190.50
Total cost of grading and bridging,	1,232,905 45	1,259,100.87	26,195.42

RESULTS OF THE COMPARISONS.

From these comparisons, it results that the actual distance, by the south route, is $\frac{2}{3}$ of a mile less than by the north—that the principal summit is 51 feet higher upon the south route, than upon the north, and that the additional elevation of all the summits, upon the south line, amounts to 113 feet more than upon the north, and that the equated distance corresponding thereto, is 5.28 miles, against the south line—that the amount of curved line, by the north route, exceeds that by the south, by $\frac{1}{4}$ of a mile, but that the whole deflection, which is the full measure of all the curvature, is 390°, or 30° more than an entire circle, greater upon the south route, than upon the north—of grade *less* than 40 feet, the south route has 34.86 miles; and the north route 38.60 miles, or 3.73 miles, in favor of the north route; from 40 to 82 feet the south has 27.56 miles, the north do. 24.50, difference in favor of the north route 3.06 miles; above 71.57, the south route has 16.66, and the north route 8.905, difference in favor of the north route, 7.63.

Hence it appears that the equated distance by the north line is less than that by the south line—that there is a greater amount of *low* grades, and a less amount of *high* grades, by the north line than by the south—that the distance between the eastern and western extremities of the high grade, is less upon the north route, than upon the south, and finally that the curvature is less.

Upon the south route, the actual distance is $\frac{3}{4}$ of a mile less than by the north line—the maximum grade is 2.18 feet less than by the north, and the estimated cost of grading and bridging $26,195.42 less.

The two first items are of small amount, and we attach but little importance to the estimated difference in the cost of grading the two lines. We think, also, that it should not receive too much consideration from the Board, in deciding upon the route. A small error in estimating the quantity of rock, even, at particular points upon either route, would counterbalance the difference. But independently of the cost, we consider that the table of results bears us out in awarding the preference to the northern route, and accordingly we recommend, respectfully, that it be adopted.

The surveys and approximate locations from Stony hill to Pittsfield, were made by Mr. Childe, and his assistant, Mr. Foster. The several routes through the Garden brook valley were also made by Mr. Childe.

Those from Pittsfield to the New York state line, were made by Mr. Potter, and his assistant, Mr. Bartlett. The surveys upon the south line, and the approximate location of the same, were made by Mr. Morgan and Mr. Barton, with the occasional assistance of Mr. Williams, Mr. Featherstonhaugh, and Mr. Roots, as levellers.

Respectfully submitted,

GEORGE W. WHISTLER,

W. H. SWIFT.

On a careful perusal of the foregoing Report and a comparison of statements with results, I fully concur with Messrs. Whistler and Swift.

WM. GIBBS McNEILL.

Boston, December 30th, 1837.

MAPS, PROFILES, TABLES, &c.

1. Map exhibiting the location from East Brookfield to Stony hill, in Wilbraham. Scale, 1000 feet to an inch.
2. Profile of the same.
3. General map of the country between Stony hill, and Tekoa mountain, exhibiting the located line to Armory Street, and the lines approximately located, from Ashley's mill to Westfield, by the south route, and to Tekoa mountain by the north route. 1000 feet to an inch.
4. Profile, Stony hill to Tekoa mountain.
5. Map of the several lines, through the valley of Garden Brook, across the Connecticut River, and to Ashley's mill, on the Westfield River. Scale, 12 inches to a mile.
6. Profiles of the same.
7. Map of the country traversed by the south routes from Westfield to the Otis summit. Scale, 1000 feet to an inch.
8. Map of the country traversed by the south route, from the Otis summit, to the New York line. 1000 feet to an inch.
9. Profile of the approximate location of the same.
10. Map of the approximate location of the north routes from Tekoa to Pittsfield. 1000 feet to an inch.
11. Map of the same from Pittsfield to the New York state line. 1000 feet to an inch.
12. Profile of the same. 1000 feet to an inch.

TABLES.

A, contains a synopsis of the south route, as approximately located, from the Connecticut river to the New York line, exhibiting the length, ascents, descents, grades, excavation, embankments, bridges, culverts, and estimated cost. It also contains the length of each curve, with its corresponding radius.

B contains the same of the north route.

C contains the cost of grading the 5 lines across the Connecticut River from Armory Street to West Springfield meadows.

APPENDIX.

No. I. Mr. Childe's descriptive Memoir of the north route.

No. II. Mr. Morgan's descriptive Memoir of the south route.

APPENDIX NO. I.

Springfield, May 29th, 1837.

To Capt. W. H. SWIFT, Engineer of the Western Rail Road.

Sir,

The northern route to the State line through Pittsfield, is the continuation of the Garden Brook route from Station 872 (14¼ miles from Connecticut river,) where the estimate for that route was terminated. The line as traced follows the valley of Westfield river, and that of the Western branch to the highest summit, a little north of the boundary line between Washington and Hinsdale—40 miles from Connecticut river; thence through Dalton and Pittsfield village to a second summit in Richmond, 57¾ miles from Connecticut river; whence it descends to and joins the Hudson and Berkshire Rail Road at the state line in the north west corner of West Stockbridge; the entire distance from Connecticut river is 62.925 miles. The features of the country traversed are truly exhibited by the maps and profiles.

From Westfield to Washington is strictly a transverse mountain valley, worn down by the action of water, until the bed of the river, through the whole distance, is either the original rock "in place," or paved with blocks and bowlders too large to be frequently moved by the force of the current.

From Washington to Pittsfield is a second valley like the former, though less broken. Five miles of it through Hinsdale being nearly level. From Pittsfield to Stockbridge, is a third valley like the former two, elevated in Richmond and the west part of Pittsfield, forming the 2d summit, and draining water east and west. This valley is broadest of the three and undulating.

Counting from Station 872 at Tekoa mountain, the distance to the Hinsdale summit is 25½ miles, and the ascent of grade 1211½ feet. Owing to the unequal descent of the valley, and the impracticability of making a road surface of its bottom lands, only 374½ feet of this ascent can be overcome in the first 13½ miles, giving an average of 27.7 feet per mile, the maximum grade being 41.39 per mile. The remaining ascent of 837 feet is distributed as equally as possible through the next 12 miles, giving an average of 69¾ feet per mile; the maximum grade being 82.18 feet per mile.

From Hinsdale summit to the crossing of the Housatonic in Pittsfield, the distance is 9½ miles, and descent of grade 452½ feet. Three and three fourths miles of this distance through Hinsdale meadows, admit a descent of 32½ feet only, averaging 8.66 feet per mile, leaving the descent of 420 feet to be effected in. 5½ miles, giving an average of 76.38 feet per mile, the maximum grade being 81.78 feet per mile.

From the crossing of the Housatonic river the grade slightly undulates; descending 5 feet in $\frac{33}{100}$ of a mile, then ascending 15 feet in 2½ miles to Pittsfield village, thence descending 5 feet in about 1½ miles to near K. Strong's, distant from Housatonic river 3.8 miles, where commences the ascent to the second summit which is attained in the distance of 4.88 miles by ascending 120 feet; average per mile, 24¾ feet—maximum grade, 45.04 feet per mile. From the second summit to the state line is 5.17 miles, descending 214.32 feet—average 41.45 feet per mile—maximum grade 55.84 feet per mile.

Total of ascending Grades from Tekoa	1346½	feet.
" descending " " "	676.72	"
" distance	48.617	miles.
Counting from Connecticut River		
Total of ascending Grades from Tekoa	1537	feet.
" descending " " "	686.72	"
" distance	62.925	miles.

The first consideration, in making the location, has been to render the grades as uniformly ascending, or descending, and consequently as easy as practicable, without increasing the distance, or in any case the degree of curvature; and secondly, wherever a short curvature could not be avoided, the grade has been reduced as much as possible. The result shows the

distance from Connecticut river to Pittsfield, to be about 2.20 miles, and on the whole distance from Connecticut river to the State line, 2.85 miles shorter than Mr. Baldwin's line. And although the grades are generally easier than might have been anticipated, from the experimental survey, yet the ascent from Root's to McElwain's, is steeper than was indicated by Mr. Baldwin, occasioned entirely by making the line straighter than his, by frequent crossings of the stream, which reduces the distance nearly ¼ a mile between those points.

For a full description of the approximately located line relative to the choice of ground, curvature, crossings of river, &c. see, in connection, the plan and profile. Commencing at 872, the line passes along the western base of Tekoa mountain, on pretty good ground, to the short bend of the river, east of Capt. Brunson's, around which two lines have been traced, uniting at Station 937¼. The first begins at Station 911, passes the bend by a 7° curve, which, at Station 926½, is reversed into one of 5½° which continues to 936¾. The second line begins at Station 909½, and passes the bend by 5½° curve, which, at Station 928, reverses into the same, ending at 937¼. The first throws half the width of the road into the water, on the length of 200 feet. The second throws the whole road into deep water, on the length 460 feet, and increases the cutting considerably, in front and east of Brunson's house. The estimated cost of the second is $6670,21 more than the first. Either of these lines would be preferable to the passage of this bend by two bridges, especially as the grade is horizontal from Station 904 to 955. From Brunson's to Finney's the line curves continually to the right or left, and passes three rocky spurs, with intervening meadows. The curves cannot be improved without increasing the rock cutting at Stations 944, 957, 969, and by building into the river at Station 940. To this point, Finney's, a route on the west side of the river seems out of the question. Continuing the route up the river, and looking at Tuttle bend, there appears no alternative, but to cross the river, at the "Narrows," and follow up the base of Tuttle mountain, as the only practicable way of passing that bend, with a curvature less than 10°, and without heavy rock cutting. The bridge at the bend, may be of two spans of 120 feet each, and so constructed that the road may curve while crossing it. The bridge at the "Narrows" will be crossed on a right line; both bridges being about 30 feet above the water.

The curvature from 1031 to 1080.60 is necessarily short, being composed of 6°, 6½° and 5° curves; but the grade ascends only 10.77 feet per mile. The impossibility of avoiding Tuttle bend, by passing South West of Tuttle mountain, by Hawley's tavern, is rendered certain by a test level, which gives the highest point of the valley 105 feet above the river at the "Narrows," and at a distance of less than ¾ of a mile therefrom.

The ground is excellent from Station 1080.60 to 1116.85, whence two lines are traced, one on each side of the river, uniting at Chester village. That on the south side is 375 feet shorter, is straighter, admits of a more favorable grade, and requires but one bridge, at a favorable point for crossing the river below Gould's mill, but is estimated to cost $5899.12 more than the other, which requires two bridges, one over the main or north branch of Westfield river—the other over the west branch at the village. Both of these crossings are much exposed to floods. The principal obstacles on the west side are, the high point at Gould's mill, and the turnpike. To cut through the one, and preserve the other, requires the stated excess of cost, over the other line.

From the 7 mile mark, the ground, for some distance is about the same on both sides of the river, but between Babcock's and Fisk's, the curvature would be much the greater on the N. E. side. This, joined with the difficulty of crossing the river at Fisk's, which is necessary, and an unfavorable crossing place, at the 7 mile mark, gives a decided preference to the South West side, where the line is traced, and no bridges required.

From Fisk's to N. Root's the ground is very favorable, and the line of easy curvature, requiring 3 bridges from 8 to 11 feet above the water.

The crossings at Porter's and Wilcox's may be avoided however, by running nearer Stebbins's house, and cutting through the two rocky points, opposite the crossing places.

The cost of doing this should be estimated before a final location is made. The curvature would be greater, and grade the same.

The crossing above the old glass-house, is indispensable, also that above Fay's mill.

Up to this point the whole cost from Connecticut river, 27¾ miles, is $337,103.09, averaging $12,147.86 per mile, including Connecticut river bridge.

From Fay's mill the ground rises rapidly, and by crossing

again, above D. Bigelow's, the highest ground is taken, without running on the mountain side, for the purpose of gaining height at the beginning of the short curve around Rhinoceros point, which is 5¾°, and nearly a semicircle. The grade through this curve, is, in consequence, reduced to 54.77 feet per mile. In like manner, the grade through the next two curves, around and from Walnut hill, is slightly reduced. The length of these curves is one mile—radii 1348.23 and 1432½ feet. The two crossings, each 50 feet above the stream, cannot be avoided, but the amount of embankment at Station 1740, and between Stations 1750 and 1762, may be reduced, by moving the 1st curve a few feet to the right.

At Station 1778 commences the steepest grade on the northern route, 82.18 feet per mile on the length of 4.016 miles, terminating at Station 1990, a little way above McElwain's tavern. Although the foot of this grade is 48 feet above the river, yet the latter falls so rapidly from McElwain's, that the grade passes but 2½ feet above the sill of his mill dam. It will probably be necessary to lower this dam, or remove it altogether, not for the purpose of materially reducing the grade, for that is impossible on account of its being so little above the bed of the stream from McElwain's to the next crossing below, which crossings cannot be avoided, but to render the bridge secure which crosses the river and dam without raising the grade. The flood marks along here are about 5 feet above ordinary water, as shown upon the profile. The most costly and difficult pass upon this most difficult section of the route is from Middlefield and Becket road, to Clark's saw mill. Two high mountain spurs of solid rock shoot by each other, separated only by the narrow bed of the stream, which winds between, receiving the waters of Cold brook upon the north. Two lines were traced here from Station 1826 to Station 1883, and the maximum curvature adopted was 3°, radii 1910 feet, but the amount of rock cutting (70 feet in depth on both) appears too formidable. The estimate, therefore, has been made upon the lightest part of each, assuming 4° curves and passing the river at a point between the crossing of the two lines. The connection of parts of the two lines is dotted on the map. The passing of this point involves the construction of four bridges, all of which are short, 70 and 90 feet span. The space between Stations 1990 and 2002 presents a favorable stopping place, the only one between

Hubbard's in Chester and the summit in Hinsdale, 9 miles from the former, and 4 from the latter.

After turning nearly a right angle at McElwain's, by a curve of 2292 feet radius, the course is very direct to the highest ground at Sibley's. Through half this distance the ground is very favorable, but the directness of the line involves heavy embankments on the upper half, at and above Crane's. These embankments, however, ought not to weigh much against a direct line, inasmuch as a heavy cut must be made at Sibley's—whether there be embankments to receive the spoils or not. It is proposed to turn the road from Deming's to Crane's, across the meadows, and pass it and the stream under one bridge, or else turn it up the hill to the right, and pass it over the Rail Road.

The latter may be cheaper, as the meadow ground is held exceedingly high. From Station 1677 below Capt. Root's to 2168 west of Sibley's, is, in every respect, the worst part of the whole route. Distance, 9, miles. Estimated cost, $447,708.14. Average per mile, $48,480.88.

From Sibley's the line passes along the west side of Mud pond, and turning to the N. W. through a ravine, passes a point of the hill near Simmons's, which forms the summit of the road, thence into the valley of Hinsdale mill stream, which is one of the head streams of the Housatonic river. The bottom of this valley from 26 mile mark to near Capt. White's, except two gravel knolls, is soft mud, from 1 to 12 feet deep, resting upon hard white gravel. In many places, piling may be required, in all ¾ of a mile.

Another line from Mud pond to Capt. White's is proposed and dotted on the Map. It passes over harder and less valuable ground, is more direct, and would have been traced but for the serious difficulty of crossing the N. W. part of Mud pond, the bottom of which is reported to be from 20 to 25 feet of soft mud. This, however, may not balance its apparent superiority in all other respects over the present line.

From Capt. White's, the ground is very favorable to Merriman's mills, and the line is most of the way straight.

The line from Watkins's should be thrown a little south, which may be done without any additional cost, and thereby avoid one curve of 4° deflection at the 29 mile mark, and shorten the artificial channels east of that curve which will be required to keep the river the north side of the road.

From Merriman's mill, the rapid descent to the Housa-

tonic river cannot be avoided. It may probably be made a little more gradual by an increase of cost and distance by leaving the south mountain a little below the Mill village, following the west branch of the river and crossing it somewhere north of the Dalton churches, thence either north of the Pittsfield road by Merrill's tavern and two patches of wood to Pittsfield village, or else by crossing the road and river near the boundary of Dalton and Pittsfield, join the present line at or near Plunkett's. It would be well, perhaps, to have a line traced in this direction before making a final location.

The deep cut at the boundary line of Dalton and Hinsdale is the only serious obstacle on the present line, which is traced on the generally even surface of the south mountain by T. Benedict's to Station 2638, where it turns from the mountain by a 1° curve and takes the most direct course over undulating, but otherwise favorable ground, to Pittsfield village.

Mr. Baldwin suggests the removal of Merriman's mill dam, but this cannot be done without buying his saw-mill and Plunkett's woollen factory, which stands on the opposite side of the road and stream ; besides, its removal will not ease the descent, unless the depth of the cut at the boundary line be proportionally increased ; and if this be expedient, the grade may be reduced to one uniform descent of 76.38 feet per mile, without disturbing the mill dam. The draining of Hinsdale meadows is not of much consequence, as the water in no place ever rises more than 3 feet above the surface. The only other possible mode of graduating this descent, and which seems the most promising, is, to strike a higher point at T. Benedict's, keeping round the mountain farther to the south, and crossing the old Pittsfield road a little south of H. Porter's, thence by a gentle curve across the south point of the meadow, cross the road again near Swain's, keeping the left bank of the Housatonic river to White's mill, where the river must be crossed, and the line continued around south of Pittsfield village, about in Baldwin's track, crossing the Pontoosuc river, and joining the main line of the present approximate location near Stevens' factory. The principal objections to this route are, indirectness and curvature, and the necessity of being from 15 to 25 feet lower between Swain's and the crossing of the Pontoosuc, than at corresponding points of the present line. In fact, there is but one reason for, and many

against either of the changes suggested. The best apparent mode of easing the descent is, to cut at the boundary line of Hinsdale and Dalton deep enough, if funds will permit, to make the grade uniform.

The line crosses North Street in Pittsfield 1000 feet north of the green, passing through F. Allen's barn on the east, and Wellbridge's house on the west side (both of which must be moved,) thence following the side hill, intersects West Street on the point of the hill in front of Mrs. Childe's house. The cutting at North Street is about 14 feet, allowing it to be bridged over the River Road. West Street, at the crossing, may be cut down to a level at small cost, and be much improved by the change. From this point, Mr. Potter continued the location.

The country being so broken from Pittsfield to the Richmond summit, three several lines have been traced—1st. The main line (which is on the map and shaded on the profile) crosses the Pontoosuc river 27 feet above the water, and the valley of North run by a heavy embankment: thence passing south of N. Strong's and C. Goodrich's, crosses the shakers' mill stream twice at an average height of 35 feet above the waters, (both of these crossings require heavy embankments,) thence ascending rapidly, passes the high ground west of Sterns' factory by a long cut of 45 feet greatest depth, from which it enters upon the general summit level, still gently ascending over favorable ground excepting one heavy side hill cut at Station 252, to the highest point at Station 318.

2d. Line A, which crosses the Pontoosuc near Pomeroy's factory, beyond which it turns to the North by a 2° curve, crosses the valley of North run at a favorable point, and by a curve south of 1910 feet radius, joins the main line at Station 100, near C. Goodrich's.

3d. Line B, which begins at Station 70 of A line, and by a 1° curve passes 100 feet north of C. Goodrich's to Station 98½—thence by a straight line it crosses the stream at a favorable point and joins the main line at Station 119.

4th. Line C, which begins at 137 main line, crosses the stream at Sterns' factory village, passes the high ground east of the stream by a 30 feet cut, and by a second crossing joins the main line again at Station 180.

5th. Line D, which begins at 112 main line, crosses the stream at a favorable point, and by a 2½° curve, takes the direction of Silver Run hollow, from which it passes by a

25 feet cut on to the general summit level, and joins the main line at Station 296, being 950 feet longer than the main line. Taking A line from West Street to Station 70, and the whole of B line to its intersection with the main line, and comparing the line thus formed with the corresponding part of the main line, there seems to be a decided preference for the former, for with the same grades, it requires less cutting and filling east of the Pontoosuc, less filling by one half across North run valley, and gives equal quantities of cutting and filling between this valley and the meeting of the lines at Station 117, which is not the case on the latter—there being nothing in that between the same points but heavy embankments too far distant to be filled from the cut at Sterns' factory. The curvature on the former too, is less than on the latter, having in view the adoption of the main line from Station 117, but the distance is 125 feet longer.

In continuation from 117, the main line is taken to the summit for the 1st estimate, disregarding C line, which requires two bridges and the removal of one house and 3 barns at Sterns' factory, and is therefore deemed less favorable than the opposite part of the main line, although the cutting on it is somewhat less.

The 1st route then, from North Street in Pittsfield to the Richmond summit, is made up from A line, B line, and the main line, the distance being 6.336 miles—maximum grade 45.04 feet per mile, and total cost $120,389.60, averaging $19,000 per mile. By comparison, the ground passed over by D line appears much more favorable than that of the corresponding part of the main line—that is, it gives a much better place for crossing the stream at Station 118, requires less filling between 118 and 136—and less cutting by more than one half between 146 and 192. Half of the latter distance on the south side of Silver run hollow requires filling, which will be supplied from the cut at the Shaker village road, while the corresponding cut on the main line would be entirely wasted.

The maximum grade on this line is 1.92 feet less than on the main line, and the ground taken over the general summit level much better. Believing therefore, that D line and parts of A and B lines will form the best route from Pittsfield to the summit, a tolerably direct junction has been assumed between B and D lines by the introduction of E

line on a radius of 5730 feet, making the length of this 2d route from North Street to the summit 6.524 miles, 950 feet longer than the 1st. Estimated cost $105,498.11—averaging $16,170.77 per mile—$2,829.23 per mile less than the 1st route. From Richmond summit to the State line, the main line is the only one traced, and is taken as the continuation of either of the preceding routes which have been estimated. Its course is all the way over very broken ground, but to Col. Rowley's tolerably direct. From the latter point, it should be moved north on to higher ground, which will diminish the curvature and bring the grade nearly, if not quite, to an equal descent of 41.68 feet per mile, the maximum being now 55.84 feet per mile.

The distance from Richmond summit to the State line is 5.170 miles.—Estimated cost $65,688.29—average per mile, $12,705.66.

Finally, the whole estimated cost from Tekoa on the best route, that is by D line, is $957,949.60—average, $19,740 per mile.

This is on the supposition, that the Pontoosuc turnpike be shut up between Root's and McElwain's. If it be inexpedient to do this, as it is most probable, an additional sum of $14,722 must be added to the above amount, making $974,671.60, which gives an average of $19,970.32 per mile.

Counting from Connecticut river, by D line, the whole distance is 63.104 miles, and estimated cost $1,144,637.16 —averaging $18,138.90 per mile.

Seven tenths of the rock cutting on the route is Gneiss, Mica Slate and Sandstone. The two former preponderate throughout the whole route. The latter is chiefly found through Pittsfield, Richmond and Stockbridge. Serpentine, Syenite and Hornblende-slate are found below, at, and above Capt. Root's in Middlefield. Granite at several points: chiefly below Clark's saw mill; and west of Washington, quartz rock, mostly in the form of bowlders.

Suitable stone for nearly all the masonry may be taken from the cuts near at hand.

The actual cost for foundations will be very small; for all the heaviest bridge masonry will rest in the natural rock or hard gravel, which form, in most cases, the banks and beds of the rivers.

Very Respectfully,
JOHN CHILDE.

APPENDIX, NO. II.

Springfield, May 28th, 1837.

To Capt. W. H. SWIFT, Engineer of the Western Rail Road.

Dear Sir,

Having now completed all the surveys, from which there could be the least probability of improving the South Route, from Westfield to New York line, I have selected, with much care, the best possible route. A full statement of the various items of expense, with reference to the Map, and Profile, has been made out. I have traced the route by a blue line, on the map of experimental lines, where it will best serve to show the efforts that have been made, and that no ground has been neglected, where there was the least possibility of success. It was owing to the anxiety, I was aware you felt, to have the investigation most thorough, that I have been longer engaged, than I at first anticipated. I believe it will be admitted that no pains have been spared, to effect this object. My party encountered much severe weather, in February and March, and were obstructed by deep snows, in Becket and Blandford. It was from other obstacles, however, which are every where met with in the mountain, that my task has been rendered difficult.

Commencing at a point, on the lot designed for the Hudson Rail Road depot, in West Stockbridge, I proceeded on favorable ground, till near Fueri's Marble quarry, where a ridge of rock obstructs the pass into Stockbridge. This being formed by the southern extremity of the mountain, curves of 1000 feet radius become necessary, and a cutting of considerable extent through the rock. I descended from this summit into Stockbridge village, at a grade of 50 feet per mile, and for the most part by a straight line; which, though involving the necessity of high bridges, and embankments across the valley formed by the Housatonic river, is on the whole, a cheaper line than could be found in any other direction. I did not, in proceeding eastward,

find it necessary to vary essentially from the experimental line, till I reached Hop brook, where, in passing on to the East mountain, a very formidable embankment became requisite, and as it could not be brought within limits, which could rationally be considered practicable, I extended the line 70 chains, by passing farther up the valley, and, by this means, succeeded in making a much better profile, ascending to Green Water pond, without exceeding 80 feet per mile.

The space between Green Water pond, and the Otis summit, which was run by Mr. Barton, presents very favorable ground—the line being direct, and not exceeding in grade, 25 feet per mile. After leaving this summit, in Otis swamp, it appeared possible to find a pretty direct line, if by any means practicable ground could be kept upon, through the valley of the Little Westfield river. My line was very encouraging, till I had descended two miles into the the ravine, through which the main stream passes. A dotted line in blue indicates this route, which however, I was forced to abandon. For, although I found myself right in conjecturing, that by bridging the stream frequently, very good ground would be attainable, the courses round certain rocky points could not be brought within admissible limits, without the most enormous expenditures. I returned, therefore, 8 miles, ao my line, and following the side hill near Peeble's brook, I pursued the line marked on the map, taking all possible advantage, in crossing this stream, as well as the one above Bates' Tannery, where a deep ravine divides the hills. The soil in this vicinity being a fine gravel, intermixed with a large proportion of sand, the depth of these fillings are not very serious obstacles. After passing Elihu Stow's, the most difficult part of my route presented itself, and I was doubtful at one time, whether I could reach Westfield plains, without exceeding 80 feet per mile. My first attempt was by the Flat lot, and Reuben Noble's, and after again running, fruitlessly, four miles, I found the point of Sodom mountain impracticable, at so great an elevation, and could I have passed round this point, my grade was directly in all the ledges, on the east side. I returned, in consequence, to Flat lot, extending my line farther down the Little River valley, and succeeded in avoiding all these difficulties, and the increased distance bringing me 80 feet lower, I was enabled to reach the plains,

when less than half the distance had been passed on the east side of the mountain before referred to; all these circumstances have tended to lengthen the south route, and increase the curvatures; the distance from New York state line, to the intersection of Mr. Williams' line, with which I have connected the present survey, is 54.018 miles, and the whole distance to Connecticut iver, 62.387 miles. The deepest cut is 64 feet, gradually diminishing to 50 feet in the space of 400 feet. At Cobble gap, the grade runs for a short distance 85 feet below the surface of the rock, consequently a tunnel for 4 chains is preferable to an open cut. Had the line been carried through the gap, the cutting would not have exceeded 50 feet, but the line would have been thrown, in that case, by a sharp curve, to the edge of a precipice, which is now avoided.

The ravine at Stow's brook is 100 feet deep, diminishing, however, in the distance of 2 chains, to 60 feet. There is also a ravine in Lee, formed by Green Water brook, 110 feet below grade. This extreme depth extends only 50 links, and at 5 chains is reduced to 50 feet. In carrying forward the survey, I have been particular to take numerous cross sections, and though in a final location, it might be expedient to vary the line, the quantities estimated would not essentially differ. In rock cuttings and other bad places, I have kept in view this consideration, always making ample allowances. There are but 5 large bridges on the route—three of 100 feet span, across the Housatonic river, and one of 40 feet, across Munn's brook. An examination of the map sand profiles, in reference to this statement, will give a tolerably correct idea of the general character of the route; and it will be seen at once how extremely difficult it has been to accomplish the object of the survey, without transgressing those rules, on which the essential value of Rail Roads depends. In running the various lines you have directed, I have never omitted to consider thoroughly, every possible mode by which advantage could be taken of the ground. And I feel confident in the assertion, that the whole space, on which we have bestowed so much labor, has been most scrupulously, and critically examined.

Very respectfully,

Your Obedient Servant,

RICHARD P. MORGAN.

A

Synopsis of estimated cost of Grading and Bridging South Route from Con. Riv. to the western line of the State.

Stations.	Length. Feet	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Desc. of Grade Feet.	Total Descent. Feet.	Elev. of Gr. ab. Con. R. Bench Mark.	Elev. of ground ab. C. R. Bench Mark.	Grade Per Mile. Feet.	Excavation. Cubic yds. Earth.	Rock.	L. Rock.	Embankment. Cubic yds.	Bridges. length Feet.	Masonry. Perches. Abutments.	Culverts.	Grubbing. Feet.	Amount.	REMARKS.
2709			5.224					78.07	72.00										128516 09	This amount includes that part of Mr. Childe's L. which extends from Con. R. to commencement of this Table.
2692	1700	0.322	8.740	6.89	6.89			88.97	78.85	21.07				8873.56					1863 41	
2680	1200	0.227	8.966					84 96	80.89	Level				7707.35	30	109.29			2546 81	
2622	5800	1.098	10.065	70.00	76.89			154.96	151.89	63.70	3798.30			18032.90					3786 91	
2544	7800	1.477	11.543	10.11	87.00			165.07	147.00	6.84	101435.84			2699.66					21301 53	
2420	12400	2.348	13.891	131.86	218.86			196.93	288.98	36.15	160176·00			160868.99	40	1580.00		1600	39516 08	
2050	37000	7.007	20.898	557.89	776.75			854.92	897.87	79.62	307263.46	68814.90		29093.45			315.20	14800	173279 09	5333 yds in Tunnel, estimated at $5 per yard.
2008	4200	0.795	21.693	43.72	820.47			898.54	898.59	54.00	21870.68	8166.00		162846.62			504.50		45918 79	
1974½	3375	0.639	22.332	11.40	831.87			909.94	897.99	17.85	58698.57			4491.00					12324 60	
1869	10525	1.993	24.326	79.72	911.59			969.66	914.67	40.00	98750.64	6148.10	12326.51	242421.86			71.61	800	66271 55	
1710	15900	3.011	27.338	240.88	1152.47			1230.54	1252.55	80.00	136882.02		26246.42	239986.08			2330.02	1500	73316 48	
1688	2200	0.416	27.754					1230.54	1230.55	Level.	4725.44	1481.00		13034.79				3000	4551 55	
1530	15800	2.992	30.746	209.44	1361.91			1439.98	1451.99	70.00	146333.35	300.00	18380.25	86732.52			503.78		43644 49	
1420	11000	2.084	32.830			36.94	36.94	1403.04	1397.04	17.73	134415.93			101406.41			541.20	3300	30460 24	
1330	900	1.704	34 534			48.05	84.99	1354.99	1372.99	28.20	72774.72			79649.06			91.59	400	17049 27	
1200	1300	2.462	36.997			5.00	89.99	1349.99	1344.99	2.03	30160.53			93562.84			159.42	4080	20620 13	
1059	14100	2.621	39.668			57.96	147.95	1292 03	1281·03	21.70	211231.54			74808.83			636.62	2730	46598 81	
927	13200	2.500	42.168	19.50	1381.41			1311.53	1311.53	7.80	96471 12			50884.68			30.60		20350 73	
576	35100	6.647	48.815			526.97	674.92	784.56	774.56	79.28	331918.00		508.97	538152.28			523.37	3820	115349 59	
536	4000	0.757	49.573					784.56	776.56	Level.	607.38			8006.38			121.41		1945 53	
460	7600	1.439	51.012	35.08	1416.49			819.64	853.64	24.38	23428.36			65028.49			194.73		14240 19	
404	5600	1.061	52.073			47.02	721.94	772.62	764.62	44.31	38574.43			46188.49			32.66		9797 56	
349	5500	1.041	53.114			7.99	729.93	764.63	758.63	7.68	43126.52			13679.40	100	595.00	41.64		12966 49	
315	3400	0.644	53.758	10.00	1426.49			774.63	746.63	15.53	5477.87			13835.24					2905 40	
178	13700	2.604	56.362	144.49	1570 98			919.12	942.12	55.49	134821.56	6528.99		355400.66	200	4527.00	152.19	500	87449 25	
104½	7350	1.382	57.745			53.78	783.71	865.34	878.34	38.92	17861.69	29092.67	28831.46	180680.47				1550	90545 15	
*140																				
50½	5425	1.028	58.773			20.92	804.63	844.42	829.42	20.35	65547.16	5310.67		32045.44			47.38		20544 99	*140 chains is the distance from the State Line to the Hudson Depot in W. Stockbridge.
86	10425	1.976	60.749			14.42	819.95	830.00	830.00	7.35	24212.94	113.33		38988.93			85.69	200	8610 50	
0	8600	1.628	62.387	9.00	1579.98			839.00	841.00	5.52	20790.83			13485.97			62.22		4552 73	
			62.387								2292344.88	124955.35	86293.61	2938586.30	370	6811.29	8445.82	38280	1120823 14	

Recapitulation of Grades, Elevation, and Cost, from Westfield to State Line.

South Route from Westfield, via Otis and Lee, to the State Line.	Elev. of Termini ab. C. R. Bench.	Elev. of Gr. at do. ab. do.	GRADES. Level.	From 0 to 10 ft. per mile.	10 20	20 30	30 40	40 50	50 60	60 70	70 80	Total Length. Miles.	Elev. of Termini ab. & below Worc'r R. R. Depot.	Elev. of Gr. at do. ab. & below do.	Cost of grading and bridging. Dolls.	Cts.	REMARKS.
	Feet.	Feet.											Feet.	Feet.			
EASTERN.	72	78.07	1.400	11.084	3.367	7.164	3.375	1.061	5.747	4.090	16.665	54.014	337.00	330.93	992706	69	$18378.68 per mile. (From West. to S. line,) or $17965.65 per mile from river to state line.
WESTERN.	841	339.00											432.00	430.00			

Table of Curves in South Route—Approximate Location.

Stations.	1° Rad. 5730	2° Rad. 2865	3° Rad. 1910	4° Rad. 1432.5	5° Rad. 1140	6° Rad. 955	42′ Rad. 8185.5	48′ Rad. 7162.5	Straight Line.	Sta.	1° Rad. 5730	02 Rad. 2865	3° Rad. 1910	4° Rad. 1432 5	5° Rad. 1140	6° Rad. 955.	42′ Rad. 8185.5	48′ Rad. 7162.5	Str't. Line.	Sta.	1° Rad. 5730	2° Rad. 2865	3° Rad. 1910	4° Rad. 1432.5	5° Rad 1140	6° Rad 955	42′ Rad. 8185.5	48′ Rad 7162.5	Str't Line.
From 0 to 39	3700	1100	800						8400	428									2700	918		1000							
									3900	501				1300						927									900
44		500								514				1300						945		1800							
64									2000	560									4600	963									1800
73		900								593				3300						972				900					
90									1700	610	1700									989									1700
103		1300								648	3800									995				600					
107		400								707								5900		1053									5800
114									700	721		1400								1058			500						
121		700								737			1600							1066									800
140		1900								747									1000	1077			500						
156						1600				778	3100									1086									1500
165									900	790	1200									1090			400						
179						1400				816		2600								1096									600
196									1700	829			1300							1106				1300					
228			3200							840									1100	1115				900					
238			1000							852			1200							1146									3100
371									13300	867									1500	1157		1100							
399			2800							882		1500								1173		1600							
412					1300					890		800								1195									2200
433									2100	902									1200	1203	800								
461		2800								908		600								1229									2600

TABLE OF CURVES IN SOUTH ROUTE.—*(Continued.)*

Sta.	1° Rad. 5730	2° Rad. 2865	3° Rad. 1910	4° Rad. 1432.5	5° Rad. 1140	6° Rad. 955	42′ Rad. 8185.5	48′ Rad. 7162.5	Str't Line.
1235	600								
1243	800								
1254	1100								
1286							3200		
1308									2200
1319	1100								
1334				1500					
1348		1400							
1357				900					
1364									700
1374			1000						
1383									900
1401	1800								
1412									1100
1420			800						
1444									2400
1447			300						
1457									1000
1460			300						
1468									800
1476				800					
1533									5700
1565	3200								
1616									5100
1641							2500		
1706									1800
1711			500						
1724									1300
1734			1000						
1754	2000								
1767									1300
1789						3200			
1806									1700
1813	700								

Sta.	1° Rad. 5730	2° Rad. 2865	3° Rad. 1910	4° Rad. 1432.5	5° Rad. 1140	6° Rad. 955	42′ Rad. 8185.5	48′ Rad. 7162.5	Str't Line.
1838						2500			
1857									
1873									1600
1893				2000					
1914						2100			
1916									200
1934									
1942									800
1953						1300			
1963									800
1967									
1973									600
1981				800					
1989									800
1995									
2019				2400					
2027									800
2035					800				
2044					900				
2057				1300					
2066					900				
2076									
2086									1400
2091					1100				
2094									300
2104					1100				
2115									1100
2128									
2131									300
2137									
2139									200
2143				400					
2146									300
2160				1400					

Sta	1° Rad. 5730	2° Rad. 2865	3° Rad. 1910	4° Rad. 1432.5	5° Rad. 1140	6° Rad. 955	42′ Rad. 8185.5	48′ Rad. 7162.5	Str't Line.
2188						2800			
2208									2000
2231		2300							
2259			2800						
2277		1800							
2286									900
2309		2300							
2315				600					
2328									1300
2336				800					
2351			1500						
2379						2800			
2383									400
2388		500							
2392									400
2400		800							
2408	800								
2424									1600
2443	1900								
2486									4300
2495	900								
2500									500
2513			1300						
2536									2300
2549		1300							
2568		1900							
2580		1200							
2610	3000								
2655									4500
2675	2000								
2706									3100
2709	300								
	37300	36000	27700	23400	6000	16700	5700	5900	126500

RECAPITULATION.

	0° 42′ Dist. Rad. 8185.5	0° 48′ Dist. Rad. 7162.5	1° Dist. Rad. 57.30	1½° Dist. Rad. 3820	2° Dist. Rad. 2865	2½° Dist. Rad. 2292	3° Dirt. Rad. 1910	3½° Dist. Rad. 1637	4° Dist. Rad. 1432.5	5° Dist. Rad. 1146	6° Dist. Rad. 955	Distance. Straight Line.	Total Distance. Miles.	
	1.079	1.117	7.064	0.2651	6.818	0.4450	5.246	0.3551	4.432	1.136	3.165	23.959	54.014	Westfield to N. Y. Line.
			0.7765		0.7433		0.1610		0.7007	0.5397		4.43-	8 424	Con. River to Westfield.
	1.079	1.117	7.8405	0.2651	7.5613	0.4450	5.407	0.3550	5.1327	1.6757	3.165	28.397	62.438	Total Con. River to N. Y. Line.

Synopsis of estimated cost of Grading and Bridging North Route from Tekoa mountain to the State line.

Sta. tion.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Descent of Grade. Feet.	Total Descent. Feet.	Elev. of G. ab. Con. River Bench.	Elev. of ground above Ct. R. Bench.	Grade per mile. Feet.	Excavation, Cubic yards. Earth.	Rock.	L. Rock.	Embankment, Cub. yds.	Bridges. length Feet.	Masonry. Perches. Abutments & Piers.	Culverts & side-walls.	Grubbing. Feet.	Amount. Dolls.	Cts.	REMARKS.
rom 872								180.5	197.426												Sta. 872 is the same as 865½ of Synopsis A of G. Brook Route, from Stony hill to Tekoa mountain.
904	3200	0.606		9.00	9.00			189.5	192.039	14 85	23780.26	2928.68	2938.58	9027.01			28.00	900	9974	09	
955	5100	0.965	1.571						179.445	level	20284.69	7321.65	908.11	41766.64			1174.80	600	17323	25	
1031	7600	1.439	3.011	40.00	49.00			229.5	222.692	27.78	39064.18	10877.19		26436.00	370	895.40	2387.20	2130	33517	22	
1080	4900	0.928	3.939	10.00	59.00			239.5	243.043	10.77	29643.10	1192.58		36832.67	240	1809.60	704.00	3480	17163	07	This distance for grade, curvature, and bridging is best, but $5891.12 more than by east side of river.
1220	14000	2.651	6.590	72.50	131.50			312.00	305.073	27.31	108321.55	8120.70		55295.8	250	1340.00	2516.50	5600	42926	73	
11.5	19150	3.626	10.217	120.00	251.50			432.00	433.760	33.09	71402 43	202.08	2309.48	42238.10			1908.50	4030	22240	97	
1490	7850	1.486	11.704	46.50	298 00			478.50	471.50	31.27	8683.87			22989.25	295	873.20	146.20		12463	54	
1587	9700	1.837	13.541	76.00	374.00			554.56	560.25	41.36	19789.98	2115.51		17015.01	130	204.00	344.60	500	11928	68	
1677	9000	1.705	15.246	122.00	496.00			676 30	655.50	71.57	1900.89		8057.64	53766.19	200	1737.60			21451	49	
1704	2700	0.511	15.757	28.00	524.00			701.50	672.33	54. 7	11952.20	150.00		52195.64	380	5754.30			29716	35	
724.9	2090	0.396	16.153	32.50	556.50			737.00	726.25	81.71				18425.94			39.20		16343	98	
1778	5310	1.005	17.158	77.50	634.00			814.5	802.10	77.20	36815.62	25488.22		153123.99	290	8368.00	5425.00	2600	82000	87	* 90 feet of this same length of common road bridge at summit.
1990	21200	4.016	21.174	350.00	984.00			1144.5	1143.48	82.18	113115.19	62353.63	44322.78	156136.66	900	16958.30	484.80	4170	164440	91	
2009	1200	0.227	21.301	5.00	989.00			1149.5	1146.99	22.00				5129.11	50	204.00			2433	52	
2165	16600	3.144	24.545	225.00	1194.00			1374.5	1400.00	71.56	144463.04	106204.49	5819.15	349854.30	*300	5063.20	186.00	6730	152772	21	Highest point at Washington summit is 1418 776 feet above Con. River Bench, or 1438.776 feet above ordinary low water.
2220	5200	0.984	25.529	17.50	1211.50			1392.0	1418.77	17.76	44949.60	4658.50		24502.73	25	127.60	67.20	2700	14678	42	
2272	5200	0.984	26.513			20.50	20.50	1371.5	1367.50	22.00	20837.40	2421.27		17864.02	72	238.80			7567	45	
2372	10000	1.894	28.407			1.50	22.00	1370.0	1370.00	.79	56227.85			19731.05	30	66.00	56.40		16217	81	$3828,74 included for piling, &c. thro' Hinsdale meadows.
2372	4200	0.795	29.202			10 00	32.00	1360.0	1371.90	12.57	15759.72			9144.72			74.80		3870	14	
2414	10000	1.894	31.096			135.00	167.00	1225 0	1225.30	71.28	153292.08	809.19	19177.00	15488.80			477.60	2130	43316	60	
2514	18400	3.485	34.581			285.00	452.00	940.0	922.25	81.78	17530.29		11552.51	167823.08				3750	39282	96	
2698																					

SYNOPSIS OF ROUTES—*(Continued.)*

Stations.	Length. Feet.	Length. Miles.	Total length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Desc. of Grade Feet.	Total Descent. Feet.	Elev. of G'ab. B'h on Ct. R. Bridge.	Elev. of ground ab. B. on Ct. R. Bridge.	Grade. Per Mile. Feet.	Excavation. Cubic yards. Earth.	Rock.	Loose R.	Embankment. Cubic yds.	Bridges. length Feet.	Masonry. Abutments & Piers.	Masonry. Culverts and side walls.	Perches.	Grubbing. Feet.	Amount. Dolls.	Cts.
2710	1200	0.228	34.809			5 00	457.	935.	931.50	22.				16547.55	100	1120.00				7549	51
2831	12100	2.292	37.101	15.00	1226.50			950.	964.08	6.54	97852.51			79808.68	*28	560.00	263.10			21786	15
2908	7700	1.459	38.561			5.00	462.00	945.	939.80	3.42	79930.22		10276.99	79739.98	144	1322.80	324.30			28164	28
3034	12600	2.386	40.946	107.50	1334.00	.		1052.50	1072.85	15.04	120144.02		31003.80	111552.24	120	4424.00	253.40	1100		54391	18
M 3066	3200	0.607	41.553						1052.50	level.	8327.75		2290.50	6512.16	†26	288.00	65.40			3895	95
3108	4200	0.795	42.348	10.00	1344.00			1062.50	1062.	12.57	53960.53		17920.16	9926.02			65.40	4500		21701	40
3166	5800	1.099	43.447	2.50	1346.50			1065.00	1067.85	2.27	30475.04		10158.32	12979.41			31.20			12236	79
3280	11400	2.159	45.606			90 00	552.00	975.	972.50	41 68	124408 74			80526.96	†72	38.00	402.10			26064	89
3384	10400	1.969	47.575			110.00	662.00	865.	848.95	55.84	65164.55			113169.90	100	761.60	76.80	2950		30285	31
3439	5500	1.042	48.617			14.32	676.32	850.68	850.68	13 76	41665.48			12578 25			670.00			9339	09
Total.			48.617								1493122 78	235073.71	167005.02	1881127.85	4122	47154.40	18172.50	43830		976841	11

Extract from Synopsis "A" of Garden Brook Route, from east bank of Con. River to Sta. 865 1-2 at Tekoa Mountain.

From 110, east side Ct. Riv. to 855 or 872 above.	14.309		169965 54
From Ct. R. to S. Line.	62.925	Total cost,	1146806 65
do. substituting "D" line.	63.104	Average cost per mile,	18224 97
Total cost of which is $1,144,637.16, keeping open the Pontoosuc Turnpike, averaging per mile.			18135 50

Second Line from Sta. 1090, east side of Westfield River, to Chester Village.

From 1090 to ‡ 1166	8600	1.629	1.629	42.	42.			282.00	278.50	25.78	52851.27	2600.00		13392.56			205.06			13477	84
‡ " 1233½	5775	1.093	2.722	30.50	72.50			312.50	306.07	33.09	61644.24	1683.33		34418.41	300	1772.80				23557	77
			2.722								114495.51	4283.33		47810.97	300	1772.80	205.06			37035	61

Second line from Sta. 2908 "A" line, through "D" line, to 3166 of Main line.

to 3028	12000	2.273	2.273	98.00	98.00			1043	1072.	43.12	75990.05		16799.43	127766.80	120	3032.00	253.40	2100		41369	72
" 3129	9200	1.742	4.015	24.00	122.00			1066	1068¼	12.57	69103.59		23020.67	10354.62	100	73.00	130.80	1500		21975	42
" 3175½	5550	1.051	5.066			2.00	2.00	1065	1067.85	2.30	29959.64		9949.95	11175.65			31.20			11998	69
											174953.28		49776.05	149297.07	220	3105.00	415.40	3600		75333	83

REMARKS.—* North Street bridge in Pittsfield, 40 ft. wide. † Common road bridge. ‖ $92,225.42.—$15,891.49 more than "D" line. ‡ Common road bridge. Level of Hudson and Stockbridge R. R. For other particulars concerning this line, which is by the north side of Westfield River, see Synopsis "A" accompanying Report of Jan. 15, 1837. Line east of River to Chester vil. is 275 feet longer than that on west side. §Common road bridge. This line is 950 feet longer than main line between same points.

RECAPITULATION.

ROUTES.	Elev. of Termini above Connecticut River Bench.	Elev. of Grade at do. above Con. River Bench.	GRADES. Level.	0 to 10 ft.	10 20	20 30	30 40	40 50	50 60	60 70	70 80	80 82	Total Length. Miles	Elev. of Termini ab. & below Worcester R. R. Depot.	Elev. of Gr. at do. ab. & below do.	Cost of grading and bridging Dolls.	Cts.	REMARKS.
North Route from Tekoa mountain, via the Pontoosuc and Pittsfield, to the State Line.	Eastern, 197.426 Western, 850.680	180.5 850.680	1.572	6.744	5.151	5.529	5.113	6.382	2.481		7.748	7.897	48.617	Eastern, —215.990 Western, +437.264	232.916 437.264	976.841	11	$20,092.00 per mile.
															Total cost by substituting "D" line as above,	939.949	62	19,740.00 "
															Total cost by substituting 2d line as above,	954.058	50	19.623.00 "

Table of Curves in the approximate location from Tekoa Mountain, via Pittsfield, to the western line of the State.

STATIONS.		Rad 1° 5730	Rad. 1¼° 4584	Rad. 1½° 3820	Rad. 1¾° 3274.28	Rad. 2° 2865.	Rad 2¼° 2292	Rad. 3° 1910	Rad. 3¼° 1763	Rad. 3½° 1637.1	Rad. 3¾° 1528	Rad. 4° 1432.5	Rad. 4¼° 1348.23	Rad. 4½° 1273.3	Rad. 5° 1146	Rad. 5½° 1041.8	Rad. 5¾° 996.52	Rad. 6° 955	Rad. 6½° 882	Rad. 7° 820	Rad. 7½° 764	Rad. 45′ 8595	REMARKS.
From 872	to 883						1100																
	892					900																	
894	899					500						550											
	904½																						
	911					650																	
	926½																			1550			This curve may be changed to 5 1-2 degrees, on radius of 1041.8, by building into the river, at an additional cost on the whole of 2d grade of $6670.21.
	936½															1000							
	943½																			700			
	947½															400							
	953											550											
	963½													1050									
	966½											300											
	970																				350		
	974.35														435								
	988.35							1400															
993.35	1002.35							900															
1010.35	1012.85									250													
	1017.85							500															
1023.35	1027.35							400															
1033.60	1037.10							350															
	1056.10																	1900					
	1072.35																		1625				
	1080.60														825								
1089.35	1092.85											350											

TABLE OF CURVES—*(Continued.)*

Stations.	Rad. 1° 5730	Rad. 1¼° 4584	Rad. 1½° 3820	Rad. 1¾° 3274.28	Rad. 2° 2865	Rad. 2¼° 2292	Rad. 3° 1910	Rad. 3¼° 1763	Rad. 3½° 1637.1	Rad 3¾° 1528	Rad. 4° 1432.5	Rad. 4¼° 1348.23	Rad. 4½° 1273.3	Rad. 5° 1146	Rad. 5½° 1041.8	Rad. 5¾° 996.52	Rad. 6° 955	Rad. 6½° 882	Rad. 7° 820	Rad. 7½° 764	Rad. 45′ 8595	Rad.	Rad.	REMARKS.
1102.85									1000															
From 1116.85 to 1140.10										2425														
1168.60							2860																	
" 1200.60 to 1205.35						475																		
" 1225.10																								
" 1233.10 to 1243.85								1975																
" 1260.10									1075					1625										
" 1284.10				2400																				
" 1301.80 to 1311.85																								
" 1318.35 to 1326.35					800				1005															
" 1331.35 to 1344.85					1350																			
" 1353.85 to 1399.60																								
" 1402.60 to 1409.60						700			4575															
" 1423.10 to 1440.60					1750																			
" 1455.60	1500																							
" 1469.50 to 1502.50	3300																							
" 1511.50 to 1525.50			1400																					
" 1536. to 1578.50			4250																					
" 1631.50	5300																							
" 1653.50 to 1658.	450																							
" 1662.50 to 1677.	1550															2700								
" 1704.												3150												
" 1724.75 to 1756.25											2050													
" 1776.75		4975																						
" 1826.50					1700																			
" 1843.50							700																	
" 1850.50											2350													
" 1874.																								
" 1837. to 1898.			1100																					
" 1920. to 1930.25			1025																					
" 1955.25 to 1960.25			500																					
" 1972.25					1200																			
" 2008.25																								
" 2016.25			800																					
" 2043.75 to 2057.75	1400																							
" 2091.50 to 2111.75			2025																					
" 2145.25	3350																							

TABLE OF CURVES—(*Continued.*)

	Stations.	Rad. 1° 5730	Rad. 1¼° 4584	Rad. 1½° 3820	Rad. 1¾° 3274.28	Rad. 2° 3274.28	Rad. 2½° 2292	Rad. 3° 1910	Rad. 3¼° 1763	Rad. 3½° 1637.1	Rad. 3¾° 1528	Rad. 4° 1432.5	Rad. 4¼° 1348.23	Rad. 4½° 1273.3	Rad. 5° 1146	Rad. 5½° 1041.8	Rad. 5¾° 996.52	Rad. 6° 955	Rad. 6½° 882	Rad. 7° 820	Rad. 7½° 764	Rad. 45′ 8595	REMARKS.
	From 2156.25 to 2160.50					425																	
	" 2180			25																			
	2198 to 2233.50											3550											
	2309.50 to 2322.50	1300																					
	2344.50 to 2361					1650																	
	2402.25 to 2430					2775																	
	" 2455.50	2550																					
	2480.50 to 2487.50	750																					
	2502.50 to 2520						1750																
	2537.75 to 2541.75			400																			
	2566.75 to 2621.75					2500																	
	2638.75 to 2667			2825																			
	2758 to 2768	1000																					
	2785.75 to 2799.75	1400																					
	2831.50 to 2852.50	2100																					
Fotter's A, B, and Main Line.	From 25 to 35.50						1050																
	68½ to 98.50	3000																					
	114 to 128.00	1400																					
	153 to 168						1500																
	" 183	2675		1500																			
	288.50 to 315.25																						
	332. to 346.						1400																
	352.50 to 364.						1150																
	" 390.25																					2625	
	419.75 to 432.75																					1200	
	497.75 to 546.16			4831																			
	577.75 to 590.25						1250																
		33025	4975	18706	2400	19200	13975	7110	1975	8905	2425	9700	3150	1050	2885	1400	2700	1900	1625	2250	3350	3825	

RECAPITULATION.

Dist. Rad. 5730	Dist. Rad. 4584	Dist. Rad. 3820	Dist. Rad. 3274.28	Dist. Rad. 2292	Dist. Rad. 1910	Dist. Rad. 1763	Dist. Rad. 1637.1	Dist. Rad. 1528	Dist. Rad. 1432.5	Dist. Rad. 1348.23	Dist. Rad. 1273.3	Dist. Rad. 1146	Dist. Rad. 1041.8	Dist. Rad. 996.52	Dist. Rad 955.	Dist. Rad. 882	Dist. Rad. 820	Dist. Rad. 764	Dist. Rad. 8595	Dist. on Straight Lines.	Total Distance. Miles.
6.255	0.943	3.543	0.455	3.627	2.647	1.347	0.374	1.687	0.460	1.837	0.596	0.198	0.546	0.965	0.511	0.359	0.307	0.427	0.066	0.724	21.433	48.617

C

Synopsis of the cost of grading five Depot Lines across Connecticut River.

	STATIONS.	Length. Feet.	Length. Miles.	Total Length. Miles.	Ascent of Grade. Feet.	Total Ascent. Feet.	Desc. of Grade Feet.	Total Descent. Feet.	Elev. of Gr. ab. Con. R. Bench Mark.	Elev. of ground ab. C. R. Bench Mark.	Grade Per Mile. Feet.	Excavation. Cubic yds. Earth.	Rock.	L. Rock.	Embankment. Cubic yds.	Bridges. length Feet.	Masonry. Perches. Abutments.	Masonry. Perches. Culverts.	Grubbing. Feet.	Amount. Dolls.	Cts.	REMARKS.
L Line, No. 3.	From 665								91.026	101.134											
	To 694	2900	0.549	0.549			27.840		63.186	78.932	50.688	35072.61			466.34					6839	04	
	751	5700	1.079	1.628			54.720	82.560	8.466	6.587	50.688	18821.90			29570.29			261.12		6629	15	
	761	1000	0.189	1.818			0.000	82.560	8.466	16.584		362.44			2850.26					555	70	
	818	5700	1.079	2.897			10.032	92.592	1.566	2.496	9.2928				36158.85	1225				69534	81	
	826.72	872	0.165	3.062	5.546	5.546			3.980	5.764	33.5808				4652.10					907	14	Average haul 450 feet.
Totals of L Line.		16172	3.062	3.062		5.546		92.593				54251.95			73697.84	1225		261.12		84465	44	
2 L Line, No. 1.	From 665								91.026	101.134											
	To 751	8600	1.628	1.628			32.560	82.560	8.466	8.892	50.688	53152.52			21186.00					11067	88	Including $300 for cutting down Armory st. and ditching
	761	1000	0.189	1.818				82.560	8.466			6179			2585.46			193.28		491	15	
	818	5700	1.079	2.897			10.030	92.592	1.566	5.469	9.2928	194			34054.49	1150				67254	26	Average haul 400 feet.
	831.25	1325	0.250	3.148	7.950	7.950			6.384	5.764	31.680				7595.68					1443	05	
To. of 2 L Line.		16625	3.148	3.148		7.950		92.593				53216.26			65421.63	1150		193.28		80256	33	
3 L Line, No. 4.	From 665																				
	To 694	2900	0.549	0.549			27.840	27.840	63.186	78.932	50 688	25072.61			466.34					5515	84	
	751	5700	1.079	1.628			54.720	82 560	8.466	6.028	50.688	27497.38			29421.04			276.16		7330	62	
	761	1000	0 189	1.818				82.560	8.466	1.451		885.99			1367.62					300	74	
	818	5700	1.079	2.897			10.032	92.592	1.566	4.613	9.2928				40138.12	1225				71307	36	Average haul 700 feet.
	823	500	0.094	2.992	3.350	3.350			1.584	5.664	35.376				2372.36					521	84	
Totals of 3 L Line.		15800	2.992	2.992		3.350		92.592				53153.96			73765.48	1225		276.16		84976	40	
4 L. L. No. 2.	665 to 694	2900	0 549	0.549			27.840	27.840	63.186	59.853	50.688	14993.56			1166.71					3748	20	
	751	5700	1.079	1.628			54.720	82.560	8.466	8.044	50.688	24053.75			30196 89			30.80		7350	18	Including $200 for cutting down Armory St.
	761	1000	0.189	1.818				82.560	8.466			67.03			2275 88					466	37	
	818	5700	1.079	2.897			10.032	92.592	1.566		9.2928				36786.01	1200				70284	13	Average haul 550 feet.
	828.75	1075	0.263	3.101	6.656	6.656			5.090		32.691				7595.68					1656	97	
Totals of 4 L. Line.		16375	3.101	3.101		6.656		92.592				39114.34								83405	85	
5 Line, No. 3.	723 to 750.	2700	0.511	0.511			29.133	29.133	6 213	0.616	56.9712				11863.69							
	759.35	935	0.177	0.688				29.133	6.213	6.173					3909.11							Average haul 1300 feet.
	756 to 772.	1600	0.303	0.991	2.253						74.3424				4840.04							
	779.50	750	0.141	0.133		2.253			8.466	8.266		172.53			421.75			115.		7901	64	Including $1771.28 for Depot embankment.
Totals of 5. Line.		5985	1.133	1.333		2.253		29.133				172.53			21034.59			115.		7901	64	

Office of the Western Rail Road Company,
Boston, January 1st, 1838.

THOMAS B. WALES Esq. PRESIDENT OF THE COMPANY.

SIR,

The Board of Directors having "ordered that the Engineers be instructed to furnish plans of the various styles of Superstructure, with estimates of the expense thereof"—we have the honor, accordingly, to submit the following Report.

The superstructure, or *rail-way*, constructed as it may be in either mode we shall describe, may be considered as a frame work placed upon the road bed; the stability, and durability of which, will, of course, depend on its *foundations*, and the nature of the materials composing the rail-way.

The foundations we shall suppose to be, as they would be, alike in either case—their principal object being the equable support of the frame-work, and its protection from the influence of frost—to guard against the effect of which, in our latitude, it would be necessary, wherever the natural soil was the least argillaceous, or such as would retain and collect moisture, to excavate the road bed to the depth of say $2\frac{1}{2}$ feet (below which the frost would very seldom penetrate) and to consolidate thereon, in lieu of the material excavated, sand, or pure gravel—or in lieu of either to construct masonry for the support of the sleepers or cross ties. Experience has shown that the better plan is to depend on sand, or gravel, rather than broken stone, or rubble masonry. It is much cheaper, generally, and in all cases equally efficient.

The foundations being alike, however the rail-way may be constructed, their cost will not enter into a comparative estimate. The actual cost of preparing them would of course depend on the character of the ground traversed by the Rail-Road—for instance, in excavations through rock, or soil other than clay, the sleepers would be laid immedi-

ately on the road bed ; or in other words, where sufficient protection was already afforded against the effects of frost, from the favorable character of the road bed, we should not of course, resort to artificial foundations.

We shall suppose, however, in order not to be disappointed in the actual cost, that throughout the whole distance, artificial foundations shall be necessary. The cost then for excavating say 8 feet wide, and 3 feet deep ; for procuring and depositing the suitable material, may, we think, then be safely assumed at $2346.66 per mile, per single track, and to this, if we add the cost of longitudinal sills of pine, hemlock, or such other timber, as may be most conveniently procured, the object and utility of which would be equably to sustain the rail-way, especially on embankments, and to facilitate the re-adjustment of the rails, when they shall have been deranged from the settling of the road bed or other causes ; we must add for this item, say, $646.80 per mile and the total cost of the foundations would be $2993.46 per mile.

We have said that the rail-way, or superstructure, may be regarded as a frame work, composed of the rails proper, tied together, at intervals, by the sleepers, or cross-ties, and as variously practised, the weight, form, and consequent strength of these Rails, determine the intervals at which they are tied, or supported. For instance the common flat bar, or rail, of ordinary dimensions, requires a continuous support, and is laid upon string pieces of wood or stone, and these stringers are tied together (in order that they may not spread or lose their parallelism) at intervals, dependant on the dimensions and strength of the stone or wood of which they are composed.

This, however, is so poor a substitute for the several descriptions of rail way, which you are accustomed to see in this section of the country, and as we think, by unanimous consent, so unsuitable to your purposes, that we hardly think it necessary to dwell longer on it, than merely to state, that inferior as it is, the only saving in first cost (ultimately it is more expensive) would be in the diminished cost of the rail itself, and which would probably amount to about $2500 per mile—that is supposing the rail to consist of the flat bar, and the wooden string piece.—The defects of this mode of construction are obvious.

Many modifications of the iron edge-rail might be enumerated, but as on a careful comparison of all of them, and after much reflection, aided by our own experience, and that of others, we are not enabled to improve on the T. rail, such as has been adopted on the Boston and Providence Rail Road—the Taunton Rail Road—the Stonington Rail Road—and lastly on the *second* track of the Lowell Rail Road; we shall submit to you estimates of cost, on the supposition of its use. The construction of these several Rail Roads, vary essentially in no particular, save that on the Boston and Lowell Rail Road stone sleepers have been substituted for the wooden sleepers, which from necessity were elsewhere adopted. The eventual saving, we doubt not, will prove the exercise of a wise economy in imitating the example of the Lowell Rail Road where stone can be procured at a reasonable cost. We submit, however, the two following estimates.

1. Cost of a single track of Rail way, of a similar construction with the Stonington Rail Road, (which differs from the Boston and Providence Rail Road in its continuous *longitudinal sills*) the weight of the rail being 55 lbs. per lineal yard, or 86.42 tons per mile, to wit,

1.	Foundations, - - - - -	$2993.46
2.	1760 sleepers 7 feet long × 8 inches thick,	528.00
3.	704 cast iron chairs (or splicing plates) 10 lbs.,	352.00
4.	9,152 spikes at 8 cts. per pound, - -	366.08
5.	86½ tons of iron rails at $60 per ton,	5185.20
6.	Laying rails, including excavation of trenches, &c. $2 50 per rod, - - - -	800.00
		$10,224.74

To this must be added, the cost of transporting the materials, an estimate of which cannot, at this time, be made with accuracy. It will be perceived, however, that it will not affect the comparative cost materially. Our own impression is, that in the above estimate we shall be found to have amply provided for all expenses; that is, that the cost of foundations will be so much less than stated, (because they will by no means be required throughout the whole distance) that the surplus will suffice for all contingencies.

2. Cost of a single track of rail-way per mile, similar to the *second* track of the Boston and Lowell Rail Road, and based upon the actual cost experienced on that Road.

1. Foundations, (the longitudinal sill was omitted on the Lowell Road,) its cost is $646.80 per mile, and is herein included, - -	$2,993.46	
2. 1760 stone sleepers, viz. 352 for the joints, at $2.50 each, - - - - - -	880.00	
1408 for the intermediate ties, at $1.50 -	2112.00	
3. Fitting and moving sleepers at 50 cts., -	880.00	
4. Spikes as before, - - - - - -	366.08	
5. Iron rails as before, - - - - -	5185.20	
6. Laying rails at $4 per rod, - - -	1280.00	
	13696.74	

A similar remark may be made respecting the item of transportation, which has in this case also been omitted. It would be enhanced because of the greater weight of the materials, and we are much inclined to think, that the difference in cost per mile between the two modes would vary but little from the sum of $4,000.

Detailed statements and specifications will be prepared and furnished whenever the Board shall require them, on which would be based the contracts for rails, and other materials.

Respectfully submitted by

WM. GIBBS McNEILL,

G. W. WHISTLER,

W. H. SWIFT.



PROCEEDINGS

OF THE

WESTERN RAIL-ROAD CORPORATION,

NOVEMBER 23, 1837.

INCLUDING AN

ADDRESS TO THE PEOPLE

OF THE

Commonwealth of Massachusetts,

ON THE APPLICATION FOR

A LOAN OF THE STATE CREDIT.

Boston:
DUTTON AND WENTWORTH, PRINTERS,
Nos. 10 and 12 Exchange Street.

1837.



WESTERN RAIL-ROAD CORPORATION.

At a special meeting of the Western Rail-road Corporation, held in Boston, Nov. 23, 1837, and very numerously attended, from all parts of the Commonwealth,

Ordered, That the President and Directors of the Western Rail-road Corporation be, and they hereby are, requested and enjoined to apply to the Legislature of this Commonwealth, at their next session, for a loan of the credit of the State to the Western Rail-road Corporation, for eighty per cent. on the amount of the stock, by a State Scrip, having thirty years to run, bearing interest at five per cent. per annum semiannually, —principal and interest payable in London to bearer, with warrants for the interest.

Ordered, That a Committee of forty, to be nominated by the President, be appointed to aid the President and Directors in their application to the Legislature for a loan of the credit of the State, as expressed in the preceding vote, with power to enlarge their number.

The following persons were accordingly nominated and appointed members of said Committee.

Francis Jackson, *Chairman*,
Amos Binney,
Bodwell Sargent,
David A. Simmons,
William Lawrence,
Francis J. Oliver,
William Thomas,
P. P. F. Degrand,
William Savage,
Thomas J. Lobdell,
Charles Wilkins,
Samuel Quincy,
Nathaniel Hammond,
James Boyd,
Henry Sterns, *Springfield*,
David Henshaw,
Benjamin Butman, *Worcester*,
Daniel Hammond,
George Darracott,
Charles Stearns, *Springfield*,
Joel Norcross, *Monson*,
James K. Mills,
Nathaniel F. Ames,
Joseph T. Adams,
Charles P. Curtis,
Julius Rockwell, *Pittsfield*,
Stephen O. Russell, *Springfield*,
Joshua Crane,
Daniel D. Brodhead,
Caleb Rice, *West Springfield*,
George H. Kuhn,
Henry Edwards,

William Wyman, *Charlestown*, William G. Bates, *Westfield.*
David Taylor, *Lynn*, Elijah Cobb,
Theodore Sedgwick, *Stockbridge*, George W. Pratt,
Francis Howe, *Brookfield*, George Colton, *Springfield.*

P. P. F. Degrand, Esq., submitted the following draft of an address from the meeting to the people of the Commonwealth of Massachusetts, and moved its adoption.

ADDRESS.

To the People of the Commonwealth of Massachusetts:

Fellow Citizens,

At a legal Meeting of the Stockholders of the Western Rail-Road, duly notified in the newspapers, and very fully attended from all parts of the State, and held at Boston, at the Old Common Council Room, on Thursday evening, Nov. 23, 1837, the following Vote was adopted unanimously, viz:

Voted, That the President and Directors of the Western Rail-road be, and they are hereby requested and enjoined to apply to the Legislature of the Commonwealth of Massachusetts, at their next session, for the Loan of the Credit of the State, to the Western Rail-road Corporation, for 80 per cent. on the amount of the Stock, by a State Scrip, having 30 years to run, bearing interest, at 5 per cent. per annum, semiannually; principal and interest payable in London, to bearer, and with warrants for the interest.

At the same Meeting, it was resolved to submit to you some of the Reasons, which make it for the interest of the People of Massachusetts, that this plan should be adopted; and the Stockholders, after mature consideration, determined to submit to you the following statement of facts and mathematical demonstrations:

The Western Rail-road breaks asunder the chains of mountains, and fills up the valleys, and furnishes the bridges, over the broad streams, which seemed to forbid your entrance, into

the trade of the fertile and immense region of the West; aye, of the Great West, which presents a boundless market for our fisheries, for our manufactures, and for our imports.

Once that road completed, not only the main trunk, but also its innumerable lateral branches, made at but little cost, *(because made in the plains* right and left of the road,) will furnish, to the whole population of our Commonwealth, the means of availing themselves of all the advantages of the vast expenditures, by other states, from Albany onwards; and also of availing themselves of that innumerable extent of Great Lakes and their tributary streams, which a kind Providence has thus invited you to take within your grasp.

This, then, is a *State-work*; not local in its character; not local in its benefits; but made, like the dews of Heaven, to fertilize every portion of our territory.

It is a State-work, like that of the New York Canals to Lake Champlain and to Lake Erie, on which New York, as a State, has already expended 10 millions of dollars; and has lately resolved to spend, on their enlargement, 8 millions more.

It is a State-work, like that of Pennsylvania, to the Great Western Waters, for which the Key-stone State has poured forth 20 millions.

It is a State-work, like that gigantic enterprise, the Baltimore and Ohio Rail-road, and the Chesapeake and Ohio Canal, on which Maryland and the United States, and other public bodies have bestowed very large sums.

It is a State-work of commanding utility, and, as such, it should be cherished by every statesman, which means every man of common sense, in this Commonwealth;—in this Commonwealth, whose fertile mine of intelligence and enterprise and industry has furnished so many pioneers, to contribute a full share in producing the well-being of the region we are seeking to penetrate, and in preparing, for us within it, a hearty welcome and a golden harvest.

It is a State-work! and it behoves us to inquire, what fate has befallen the other works like to this? Is there a statesman, in the State of New York—is there a solitary individual, whether wealthy or otherwise,—who thinks that, either his State, or his own individual dear self,—is the poorer, in consequence of the application of the public purse and of the public

credit—to this great chain of internal improvements? Is such a man to be found, in the great commonwealth of Pennsylvania? Is there to be found, in the whole extent of the United States, an individual of sense, who is not entirely convinced, that these expenditures have produced no loss, either to the States or the individuals in them? but, on the contrary, have produced perennial and inexhaustible mines of wealth, which only grow the richer, the more they are explored!

Fellow Citizens,

Already we see you inspired and burning with impatience and zeal, to reach the Great Western Waters; and it is to satisfy this patriotic, this enlightened zeal, that we propose the present plan.

The individual subscription to the stock of the Western Railroad was made, by the whole mass of business men, with a view to promote the general welfare, by the benefits of the road, to the whole public; themselves, as a part of that public, partaking of these benefits, in common with you all. It is but the unvarnished truth to state, that this was, on the part of the Stockholders, an enlightened and patriotic offering, to the common good, of a considerable portion of their active cash capital. The disasters of the last year have diminished the ability of these subscribers, as a mass, thus to spare, for public purposes, so large a portion of their cash means: and (as they conceive) have imposed, upon the State, the duty of considering the expediency, (for the public good) of leaving the shattered remains of private fortunes, to fill the usual channels of a reviving (though as yet feeble) course of business; while the gigantic credit of the State extends its shield over them, and undertakes to cope with an enterprise of such magnificent results for the State.

Should the present plan not prevail, the want of ready money will very much retard—if not ultimately arrest—the progress of the work; while the adoption of the plan will, at once, create tangible funds, and enable us to prosecute the work with the greatest celerity.

FELLOW CITIZENS,

Should the present plan prevail, the Western Rail-road will be finished four years sooner: and upon the one million of dollars of stock now held by the State, there will be avoided the loss of the interest of said 4 years, viz: $240,000 00

Should the present plan prevail, the contracts which would be made, at the present low prices, will save, to the State, at least 30 per cent. on their said $1,000,000 of stock, say, 300 000 00

Thus, there will be a saving to the State on their own $1,000,000 of stock, of, 540,000 00

and a like saving, to the individual Stockholders, on their $2,000,000, of, 1,080,000 00

Saving to the People of the Commonwealth, as a mass, 1,620,000 00

While we only ask of the State the Loan of their Credit, for 80 per cent. on our $2,000,000, viz: for 1,600,000 00

In furnishing which, the State have the guarantee, against loss, of the amount paid, by the Stockholders, viz: 400,000 00

No one can reasonably doubt the success of the Western Rail-road, when once opened. There is not a bank, nor a capitalist, in the habit of loaning on Rail-road Stock, but what considers a loan of 80 per cent. on the Stock of the great Rail-roads, now finished, viz: the Boston and Worcester Rail-road, the Boston and Lowell Rail-road, and the Boston and Providence Rail-road, as a loan of the safest character.

We may, therefore, safely assume, that there is no risk of loss to the State; but, on the contrary, a clear demonstrable gain of $1,620,000.

FELLOW CITIZENS,

Should the present plan prevail, the Western Rail-road will be finished 4 years sooner. What is 4 years, to the probable existence of every business man in the State, and of every farm-

er, and of every active man in Massachusetts? What is four years? Is it not as much as 25 per cent.? Shall we then curtail, by 25 per cent., the business life of every actor, by rejecting the present plan?

It is very desirable to reduce the term of military service, without reducing our military efficiency. Once the Western Rail-road finished, we can thus reduce this term of service. Instead of having every citizen a soldier, from 16 to 45 years of age, we can have it from 20 to 25 years. Thus reducing our citizen soldiers to a quarter part of their present number, we will save (even in the trainings in time of peace) at least $3 for 3 days on 75,000 men, or $225,000 per annum; and yet, by the facility and celerity of transportation, our force will remain as great, nay, even greater, in efficiency.

At this particular time, there is, in the State, a great mass of persons, willing to work, but unable to find work. Shall we create this mass of capital, to employ, at once, usefully, this mass of labor? Or shall we leave it to seek shelter and to seek food, in the poor houses; or to mortgage future earning, and the future welfare of their families, by contracting burthensome debts, which (even when business revives) will hang, like a mill stone, about their necks?

FELLOW CITIZENS,

Should the State think proper thus to create, on the Stock held by individuals, a State Stock, for	$1,600,000 00
it will naturally create a like Stock, to pay 80 per cent on its own Shares, viz:	800,000 00
Thus, there will be, at hand, a mass of	$2,400,000 00

of exchange on England; because this stock will be payable in England, where it is saleable at an advantageous price.

Allow us to present, to your earnest attention, *the effect of this creation of such a mass of Exchange on England*, ON THE RESUMPTION OF SPECIE PAYMENTS.

The great problem to be solved is "*how to resume Specie Payments without producing great distress.*" We all know that distress of the most aggravated character cannot be avoided, if

curtailment is resorted to; and we also know that curtailment was tried, in vain, in England, from 1797 to 1822, at seven distinct periods, the history of which was, at each period, curtailment, distress insufferable, turning out of the ministry, and then, (in despair of attaining the object,) a fresh increase of Loan: and some of the most distinguished men were actually disposed to look upon the resumption of specie payments as an impossibility.

At last, the resumption of specie payments, by a great mass of banks in the United States, demonstrated to the world, that this great result could be obtained, and stimulated the proud isle to fresh exertion. From the latter end of 1815, to the end of 1817, the Bank of England reduced the amount of "Bills and Notes under Discount" tremendously, say, from 16 million pounds sterling, to 2 1-2 million pounds sterling; and yet did not resume and could not resume. Frightened at the misery they had produced, they shrunk aghast, and again increased the Loan: and gave up the pursuit. They had overlooked the great American invention, by which our banks were enabled to resume.

Soon after the peace of 1815, the banks in New York, Philadelphia and Baltimore resolved to resume, and tried their hand at curtailment. They only produced mischief; and public sentiment compelled them to retrace their steps. Curtailment produced, as usual, its natural offspring, viz: general distress, and, of course, general distrust, and, of course, terror; all of which is the very reverse of the first and indispensable elements of resumption of specie payments, viz: quiet and ease and comfort, and their natural offspring, viz: general and generous confidence. These are the natural result of a gentle, general increase of Loan. The discovery (by American genius) of this undeniable truth led the way to the resumption of specie payments. It was not done by curtailment. It was done by the very reverse of it, viz: by the agreement of the then new bank of the United States, with the local banks, to discount 2 millions in New York, 2 millions in Philadelphia, and 1 million in Baltimore; and to take, by the hand, all the local institutions and sustain them, shoulder to shoulder. Thus it was that a force, *foreign to the then common course of trade*, was brought in, to give *additional* strength to the local banks, who, one and all, declared that,

without it, they would not, and could not undertake to resume specie payments.

And this is the true secret, viz: *non-curtailment, a gentle increase of Loan*, and A FORCE IN ADDITION TO THAT IN EXISTENCE, to inspire a tone of general confidence, in each and every one of the public, and in each and every one of the banks; and it was by this, that, for the first time in the history of the world, success crowned the attempt to resume specie payments by a mass of Banks.

Baffled in 1815, 16 and 17, in their efforts to resume specie payments, by curtailment, the Bank of England and the British Government afresh sought the causes of success on this continent. Americans, who happened at the time to be in London, were consulted by the ministry; and, in result, the true cause was discovered, viz: that success was due to the aid of a fresh force, a force foreign to the then existences in trade, and to a gentle increase of Loan. The new elements were accordingly brought into action in 1822, viz: by a reimbursement to the bank by government, (a force foreign to trade) and by a gentle increase of Loan. A general kind feeling and tone of confidence and prosperity being thus created, the bank was enabled (at last without an effort) to resume, even before the time appointed.

If, then, we arm the mass of banks in Massachusetts, with this auxiliary force, viz: $2,400,000 of exchange on England, it will furnish, in the Spring, an amount more than sufficient to pay our cash-balance then due to Europe and to New York; and we can then resume specie payments without curtailment, and without producing incalculable mischief, and with a force in hand, sufficient to inspire general confidence.

Whether, then, we consider the plan proposed, as an important element in the resumption of specie payments, or as a clear saving to the State, or to the Stockholders, or to the public at large, or in its moral effects, the measure recommends itself equally as a measure fitted to produce incalculable benefits.

Read and adopted.

Ordered, That the Treasurer of the Corporation, for the time being, under the order of the Board of Directors, be authorized to execute, in the name of the Corporation, such securities as may be necessary for any loan or loans which the Commonwealth of Massachusetts may grant to the Corporation of their credit, by proper instruments; and to pledge, as collateral security therefor, the franchise of the Corporation, together with the road and its appurtenances,—including all additions made to the same after such pledges shall be given.

Ordered, That all the foregoing proceedings, including the address now adopted by the stockholders be certified by the President and Clerk, printed, and a copy thereof forwarded by the Clerk to the Governor, and to each Counsellor, Senator and member of the House of Representatives, and to each Stockholder.

THOMAS B. WALES, *President.*
ELLIS GRAY LORING, *Clerk.*



(3)

PROCEEDINGS

OF THE

WESTERN RAIL-ROAD CORPORATION,

DECEMBER 12, 1838;

INCLUDING AN

ADDRESS TO THE PEOPLE

OF THE

Commonwealth of Massachusetts,

ON THE APPLICATION FOR

AN ADDITIONAL LOAN

OF THE

STATE CREDIT.

BOSTON:
JAMES MUNROE AND COMPANY.
1838.



[To Mr.

PROCEEDINGS

OF THE

WESTERN RAIL-ROAD CORPORATION,

DECEMBER 12, 1838;

INCLUDING AN

ADDRESS TO THE PEOPLE

OF THE

Commonwealth of Massachusetts,

ON THE APPLICATION FOR

AN ADDITIONAL LOAN

OF THE

STATE CREDIT.

BOSTON:
JAMES MUNROE AND COMPANY.
1838.

TUTTLE, DENNETT AND CHISHOLM, PRINTERS,
No. 17 School Street.

WESTERN RAIL-ROAD CORPORATION.

At a special meeting of the Western Rail-road Corporation, held in Boston, December 12, 1838, and very numerously attended from all parts of the Commonwealth,

The President and Directors were instructed to apply to the Legislature, at its next session, for a loan of the credit of the State to the Western Rail Road Corporation, for a sum sufficient to complete and put the road in full operation, not exceeding the sum of Fifteen Hundred Thousand Dollars; by a State Stock, expressed in the money of Great Britain, having thirty years to run, bearing interest at five per cent. per annum, semi-annually; — principal and interest payable in London, to bearer, with interest warrants attached.

Ordered, That a Committee of fortyseven, to be nominated by the President, be appointed to aid the President and Directors, in their application to the Legislature for a loan of the credit of the State, as expressed in the preceding vote; with power to enlarge their number.

The following persons were accordingly nominated and appointed members of said Committee.

Francis Jackson, *Chairman.*	Henry Stearns, of *Springfield*
Amos Binney,	Charles Henshaw,
Bodwell Sargent,	Samuel Greele,
David A. Simmons,	Henry Rice,
William Lawrence,	Chas. Grennell, of *N. Bedford*,
Francis J. Oliver,	William Beach, of *Gloucester*,
William Thomas,	Benj. Butman, of *Worcester*,
P. P. F. Degrand,	Daniel Hammond,
William Savage,	George Darracott,
Thomas J. Lobdell,	Chas. Stearns, of *Springfield*,
Charles Wilkins,	Joel Norcross, of *Monson*,
Samuel Quincy,	Nathaniel F. Ames,
Nathaniel Hammond,	Joseph T. Adams,
James Boyd,	Charles P. Curtis,

Julius Rockwell, of *Pittsfield*,
S. O. Russell, of *Springfield*,
Joshua Crane,
Nathan Appleton,
C. Rice, of *West Springfield*,
George H. Kuhn,
Henry Edwards,
Benjamin Stevens,
Albert Fearing,
Wm. Wyman, of *Charlestown*,
David Taylor, of *Lynn*,
T. Sedgwick, of *Stockbridge*,
Francis Howe, of *Brookfield*,
William G. Bates, of *Westfield*,
Elijah Cobb,
George W. Pratt,
George Colton, *of Springfield*,
James Savage,
Lot Pool.

P. P. F. Degrand, Esq., submitted the following draft of an Address to the people of the Commonwealth of Massachusetts.

ADDRESS.

To the People of the Commonwealth of Massachusetts:

Fellow Citizens,

At a legal meeting of the Stockholders of the Western Rail-Road, duly notified in the newspapers, and very fully attended, from all parts of the State, and held at Boston, at the Old Common Council Room, on Wednesday evening, Nov. 28, and by adjournment on the 12th of Dec. 1838, the following vote was adopted by an overwhelming majority, viz.:

Ordered, That the President and Directors of the Western Rail-road Corporation be, and they are hereby requested and enjoined, to apply to the Legislature of this Commonwealth, at their next Session, for a loan of the credit of the State, to the Western Rail-road Corporation, for a sum sufficient to complete and put the road in full operation, not exceeding $1,500,000, by a State Stock, which may be expressed in the money of Great Britain, having thirty years to run, bearing interest at five per cent. per annum, semi-annually;—principal and interest payable in London, to bearer, with warrants for the interest attached.

At the same meeting, it was resolved to submit to you some of the reasons which make it for the interest of the people of Massachusetts that this plan should be adopted: and after mature consideration, the Stockholders determined to submit to you the

following statement of facts and conclusions, naturally arising from these facts.

Fellow Citizens,

Thanks to the enlightened public spirit of the Legislature of Massachusetts, for 1838, — the Western Rail-road, — that great work which is destined to restore to our Commonwealth her wonted rank, among the first States in the Union, — has been progressing, since the last Session, with unexampled rapidity and with the greatest economy — the very money spent in its construction furnishing sustenance to a great mass of industrious men, many of whom, but for this, would have been out of employ, — and enriching, by its disbursements, the country through which it passes, — as well as augmenting the active capital of the State. The magic power of the credit of Massachusetts, has not only served to draw from abroad, at a low rate of interest, all the money thus spent, but it has, also, by furnishing a large amount of exchange on London, — equal to specie, — had a direct tendency to protect our banks against any demand for specie. By inspiring a general tone of confidence, it has greatly assisted these banks in resuming specie payments, long before the period prescribed by the Legislature, without causing that degree of pressure, which greater curtailments would necessarily have produced. Thus has the wisdom of the Legislature of Massachusetts given very important aid, in bringing about, — in fifteen short months, and with comparatively trifling sacrifice, — that great financial change, (the resumption of specie payments,) which Great Britain herself was twentyfive long years in accomplishing: and which she only accomplished, after the prostration, several times repeated, of whole masses of her most industrious, most enterprising, and most useful citizens.—What a proud trophy this for the people of the Bay State!

Fellow Citizens,

It is now placed beyond all doubt, that the Sinking Fund, which (agreeably to the provisions of the Act of 1838,) is provided by the Western Rail-road, will exceed, in amount, the anticipations of the friends of the Law, and will be fully adequate to

extinguish, before maturity, the full amount of the State Stock, loaned by Massachusetts to the Western Rail-road under that Act.

The character of Massachusetts, long advantageously known in Europe; — the *Statistical Tables* of the $80,000,000 annual product of our industry, which the foresight of our Legislature had caused to be prepared, (and which the Directors of the Western Rail-road failed not to forward to London)—the advantageous and convenient shape, which a wise legislation has given to the Stock itself, have procured, for the Western Rail-road Loan, the highest price, in the London market, of any loan, of any date, of any kind, by any individual, or corporation, or State, on the whole American Continent. The Stock thus far disposed of (being all that had been received in London,) has been sold at a premium which (added to the premium on the exchange,) will create, at once, a Sinking Fund of 11 per cent., to be paid over to the Treasurer of the Commonwealth, and to be by him invested: — and this is five per cent. more than the friends of the Law had calculated upon as the basis, while advocating the passage of the Act.

Fellow Citizens,

Before the close of next summer the Western Rail-road will be in full operation to Springfield. The most difficult part of the road west of Connecticut River, being that part which it would take the longest time to construct, *has* (agreeably to a wise provision of the Law,) *been attended to, with unceasing industry, and upon it as many men have been constantly employed, as could possibly work to any advantage. Our neighbors of the State of New York have already constructed a link, for our road, from the Western limit of our State, to Hudson*, on the Hudson River, *on the line of Rail-roads*, which is partly already finished, and partly in construction, and which, at no distant day, *will carry us to the interminable web of Rail-roads*, now preparing for our reception in *the Great West: and also carry us to the* 25,000 *miles of navigation* on our inland seas, and our boundless rivers and canals, in the great Valley of the Mississippi. *All these advantages we shall secure, by completing our Western Rail-road, which is only* 116 *miles in length!!*

FELLOW CITIZENS,

Much has been done, and been well done, towards uniting our Commonwealth with the great Western World: — and it now remains to search out and to point out what future course will most promote this great object.

It cannot be denied that a Rail-road saves three fourths of the labor, and of the expense of transporting burthens, and of transporting persons, — taking into view the great saving of time. At a low estimate, it is calculated that this expense (of transportation and travel) for the whole Commonwealth, exceeds $16,000,000 annually; — admitting, therefore, the capacity of a saving of $12,000,000 per annum. Is it not, then, most clearly, for the public interest, that this wasteful expenditure of three fourths of the enormous sum, paid by our people, for transporting burthens, and for transporting persons, should be at an end, as quickly as possible, as to every inhabitant of every foot of our soil? *Every month's delay is a shameful waste of* $1,000,000! *The Western Rail-road,* in continuation of the Worcester Rail-road, *is the great backbone of the system, which will expel, from every section of our territory, this vast, and needless, and wasteful expenditure.* IT IS, THEREFORE, FOR THE PUBLIC INTEREST, THAT THE WESTERN RAIL-ROAD SHOULD BE FINISHED, AND BE IN ACTUAL OPERATION, WITH AS LITTLE DELAY AS THE NATURE OF THE COUNTRY WILL PERMIT. LET US RESOLVE THAT THIS SHALL BE DONE, *and let us soberly look to the actual, practical means, within our reach, to carry our purpose, unerringly, into effect.*

FELLOW CITIZENS,

After expending the whole amount of the loan, furnished by the State, under the Act of 1838, *the Western Rail-road will still want* $1,500,000 *to complete it to the State line, and to furnish it with depots, and cars, and locomotives. If the State of Massachusetts should, at once, decide, that they will issue, as wanted, their Stock to that amount, and for that purpose, under the like safe and salutary provisions, which guarded the Act of* 1838, — THIS SIMPLE DECISION, INVOLVING NO RISK TO THE STATE, WILL SOLVE, AT ONCE, THE WHOLE PROBLEM, AND WILL

CAUSE THE ROAD TO BE FINISHED, AND TO BE CARRIED INTO FULL OPERATION, IN THE SHORTEST POSSIBLE TIME, AND WITH THE BEST ECONOMY.

That there will be *no additional risk* to the State, from making *this additional loan*, is very clear; because, from the very wording of the Act, and from the very nature of the case, *every dollar* of this *additional money must be expended* TO INCREASE, *to that full amount*, THE VALUE OF THE PROPERTY pledged to the State, viz.: The whole Rail-road, and its whole property and apparatus, and its franchise and revenue, as prescribed by the Act of 1838.

Neither can there be any doubt of the success, and good net revenue of this great work. Like the New York Grand Canal, it leads to the Great West; — and we all know that this Canal paid for itself (principal and interest,) in 12 short years, and gives, since that time, $1,000,000 net annual revenue to the Treasury of the State. Like the Pennsylvania chain of Canals and Rail-roads, it leads to the Great West; — and it has been officially announced, by the Chief Magistrate of that great State, that these great works, which had to surmount, and even to tunnel, the Alleghany Mountains, — although they cost $20,000,000, — will soon pay for themselves, and then bring in, every year, several millions net revenue, to their Public Treasury.

FELLOW CITIZENS,

Should Massachusetts decide not to put her shoulder to the wheel, at the January Session of 1839, the Directors of the Western Rail-road will naturally slacken their onward march, and (even if the proposed aid should be obtained, at the January Session of 1840,) the Western Rail-road will not be in full operation, on the whole line, so soon, by at least six months.

This delay of six months, naturally produces loss, as follows:

Six months interest on a large portion of the $3,000,000 invested.

Six months loss of time, in ultimately completing the Rail-road system of the whole Commonwealth; which loss of time will be a waste, for six months longer, of three fourths of the labor and expense now paid for transporting burdens and persons.

Six months delay in the creation of a very large amount,

being the *additional value*, given to the land and other property in Massachusetts by the Rail-road system ; say six months interest, on said additional value.

Six months delay in ceasing to pay commissions and other charges, which we now pay on a large amount of the products of our industry, to New York, Philadelphia, Baltimore, and New Orleans.

Thus occasioning, by this six months delay, a loss far exceeding the whole amount of aid now applied for.

On reflection it will be perceived that this issue of Stock for $1,500,000, *is only the issue* (*on good security*) *of a guarantee, by each inhabitant of Massachusetts, to the amount of* $2 *per head.* IS THERE A MAN OF COMMON SENSE, WHO, BENT UPON A GREAT PURPOSE, WILL THINK OF STOPPING, EVEN FOR AN INSTANT, FOR SUCH A TRIFLE ?

FELLOW CITIZENS,

Every one will see, at a glance, that there is an economy of at least 3 per cent. per annum, in employing money, borrowed on the credit of the State, at less than 5 per cent. interest per annum, instead of investing, in fixed property, the active money of active business men, to whom active money is worth, at least, 8 per cent. a year.—A saving of 3 per cent. per annum, for 30 years, amounts to 90 per cent. besides the accumulating and compound interest, on the 3 per cent. saved, every year. Will a calculating people think proper to throw away this great saving by rejecting the present plan ?

FELLOW CITIZENS,

Should the State decide that they will not assist the Road (and thus decide in 1840, as well as in 1839,) the Stockholders will naturally conclude that this decision is contrary to the public interest, and contrary to the spirit of the age; and will be compelled again to present their views for the consideration of the Legislature, in 1841. Hence, a delay of another year — and a public loss of a *very large sum*, to be added to the public loss, occasioned by the delay of the preceding six months.

If, by the want of early forecast, the $100,000,000 *additional*

value, ascertained to have been given, by the New York Erie Canal, to the Real Estate of the State of New York, had been created 12 years later,—by the Canal being finished 12 years later,—there would have been a loss of 12 years compound interest, upon the said $100,000,000. *In other words there would have been* AN ACTUAL LOSS OF ONE HUNDRED MILLIONS OF DOLLARS, *merely by the delay of said twelve years!*

FELLOW CITIZENS,

The act of 1838, grants to the Western Rail-road, the loan of the credit of the State, for	$2,100,000
The present application is for the loan of this same credit, for	1,500,000
Thus, on a property which cost $4,500,000, it will be a loan of	$3,600,000
Of this amount there is applicable to the one third of the stock of the Western Rail-road which is held by the State itself, and for its own account,	1,200,000
And applicable to the Stock held by the Private Stockholders,	$2,400,000
While the Private Stockholders will have paid in,	600,000
As regards the Private Stockholders, it is therefore the loan of a credit for $2,400,000, upon good property, which actually cost in cash, well spent,	$3,000,000

In other words, it will be a loan of the credit of the State for 80 per cent. on the Stock of a Rail-road, built in the best style, in the most economical manner, and on a line of travel which cannot fail of success. IT IS CONSEQUENTLY A LOAN OF THE SAFEST CHARACTER. Our most retired and prudent loaners are content to lend 90 per cent. on the stock of the Boston and Lowell Rail-road, or of the Boston and Providence Rail-road, or of the Boston and Worcester Rail-road. In making the proposed loan of its credit, the State itself being the owner of one third of the stock, is the gainer of a very large amount even as a simple Stockholder.

FELLOW CITIZENS,

It is well known, that motives of public interest produced the individual subscription to the Western Rail-road. The change of times has deprived these subscribers of the very means which their chivalry prompted them thus to appropriate, to the carrying on of a work, which is in fact a State work; and to the like of which, — in New York, and Pennsylvania, and other States,— the Public Purse, and the Public Credit have been devoted, to the full amount required — and with a success, surpassing the most sanguine anticipations.

The Stockholders of the Western Rail-road have, by the calamities of the last 3 years, lost upwards of $20,000,000. Will the State insist, that they shall now, (after all their losses) go on and actually furnish cash capital for a work, which, from the very outset, was, in fact, *a State work?* and which should from the very beginning to the very end, have been done, for the Public Good, by the Public Purse and by the Public Credit? Is it good policy to diminish (by this investment of private funds) the shattered remains of the private active means of the whole mass of industrious men? Does not the good of the community imperatively demand that these active means should be wholly devoted to the current, reviving, general, active business?

FELLOW CITIZENS,

Massachusetts has only 7,800 square miles, while it contains upwards of 700,000 inhabitants. Its territory is very small, compared to its population and to the products of its industry. It is therefore peculiarly favorable, for a system of Rail-roads, pervading every portion of its soil; because such a system can be carried to completion at but little cost, when compared with other States, and when compared with her resources and with the great results to be obtained.

FELLOW CITIZENS,

Will Massachusetts discard her own system? From her earliest settlement her public roads have been considered a public concern, to be carried on at public expense. She has

deemed it a duty to provide her whole territory with the best roads extant; gradually improving these roads, as the science of road-making advanced. This system has raised her fame and has been found eminently for her interest. By pursuing it, she has (as compared with many other States) saved her citizens half the expense of transporting burdens and of transporting persons. Will she now shrink from continuing to perfect this system by placing herself upon a par with the light of the age? Will she deny to herself the pleasure, the advantage, of saving, to her citizens, three fourths of the expense now yet remaining; and of saving the present road-tax, as to the wear and tear of common roads, produced by the transportation of the immense quantity of goods and of passengers, for which Rail-roads are preferred the very moment they are built? Will Massachusetts deny herself the pleasure and the advantage of obtaining this great result, as quickly as practicable? Will she allow herself to linger in the rear of this eventful age?

Fellow Citizens,

Let us now consider the wonderful effects of Rail-roads in time of war. During the late war, with Great Britain, Castine (which then formed a part of the State of Massachusetts) was taken possession of by the enemy. The enemy took possession of it and kept possession of it, with a trifling force. Thus it was, *simply for the want of Rail-roads.* A general web of Rail-roads would have given to Castine the almost instantaneous command of an overwhelming force, and caused its evacuation: or rather, the very knowledge of this power of concentration of an overwhelming force would have prevented the attack altogether; thus saving, to our brave people, the disgrace of yielding to the enemy quiet possession of our soil; thus saving also all expense of blood or treasure. We say of blood; because the system of Rail-roads would prevent the attack. We say of treasure; because the peaceful pursuits, on a Rail-road, pay for its cost.

Had the city of Washington, during the war of 1812–15, possessed the power of concentration of force, now furnished by the Philadelphia and Baltimore Rail-road, and by the Baltimore and Ohio Rail-road and its Washington Branch, the enemy

would not have dared there to pollute the American soil, and we should have been spared the disgrace of having the Capitol and the Public Library, and the defenceless mansion of the President, burned by them;—neither would Alexandria have been taken and our ships destroyed;—nor would the Navy Yard at Washington have been burnt;—nor would Baltimore have had to fire a gun, in her own defence, or had to mourn over the loss of some of her best and bravest citizens.

Had New Orleans possessed the power of concentration of force, which is now furnished by the steam navigation on the Mississippi, the enemy would, beforehand, have perceived the folly of attacking such a formidable force, and would not even have made the attempt.

Thus it is, that Massachusetts can, by a web of Rail-roads, fulfil in the best, the most scientific, the most efficient, and the cheapest mode, the duty incumbent upon her, of furnishing a perfect defence for every portion of our State. Of this web of Rail-roads, the Western Rail-road is the base, as (with the Worcester Rail-road) it traverses the whole length of our State, from the capital to its western limit—breaking asunder the mountains, filling up the valleys, and crossing the rivers; and furnishing the best means of having (on each side of the Road, and on the seaboard) other Rail-roads, on a comparatively flat country, at a comparatively small expense.

In case of war, and consequent interruption of our coasting trade, the Western Rail-road will place within our reach our best market for the products of our industry, and will enable us to obtain (free of war-risk and of war premium of insurance) the sugar and the cotton of Louisiana and the flour of Ohio;—articles which (owing to the war-risk) reached, here, during the last war, with Great Britain, the following prices:

Sugar, - - -	$30 00	per 112 lbs.
Cotton, - - - -	45 cts.	per lb.
Flour, - - -	20 00	per barrel;

while these very articles, at the places of their growth, were equally depressed below their proper value.

Fellow Citizens:

Five years and a half have already elapsed since the granting of the Charter of the Western Rail-road. Why this long delay? Why have we thus wasted nearly double the time originally necessary to finish this great work? Has it not, most assuredly, been for the want of an earlier application of the credit of the State? Had this credit been granted the very day the charter was given, we should, long ere this, have been enabled to use the whole road. Let the consequences of our past neglect light up our future path. *To carry the Western Rail Road to completion, as rapidly as possible, it now only requires the loan (on abundant security) of the Credit of the State for $1,500,000; being only $2 for each inhabitant of our Commonwealth.* Shall posterity tell, and justly tell, that we were arrested by such a trifle, while earnestly bent on securing a sure defence, without cost, for our State; while earnestly bent on securing, both in peace and in war, our full share of the immense trade of the largest body of the richest land in the known world;—of a body of land, destined, at no distant time, to contain more inhabitants and to bring forth more of the products of the earth, than the whole of the Atlantic States? Or shall we,—the people of Massachusetts of the present day,—be classed, and justly classed, in all future ages, among the greatest benefactors of our beloved Commonwealth, by making, at once, the great invention of the age, tributary to our present and future welfare, to the full extent in our power;—as we are accustomed to do with every labor-saving machine, and with every new and useful invention?

Read and adopted.

Ordered, That the Treasurer of the Corporation, for the time being, under the order of the Board of Directors, be authorized to execute, in the name of the Corporation, such securities as may be necessary for any loan or loans which the Commonwealth of Massachusetts may grant to the Corporation, of their credit, by proper instruments,—and to re-affirm, as to this new loan, the pledge of collateral security therefor, of the franchise

of the Corporation, together with the Road and its appurtenances, including all additions made to the same, after such pledges shall be given.

Ordered, That the proceedings of this meeting, including the address now adopted by the Stockholders, be certified by the President and Clerk of the Corporation, and a copy thereof be forwarded, by the Clerk, to the Governor and to the Lieutenant Governor of the Commonwealth, to each Counsellor, Senator, and member of the House of Representatives, and to each Stockholder.

THOMAS B. WALES, *President.*
ELLIS GRAY LORING, *Clerk.*

A

BRIEF STATEMENT OF FACTS

IN RELATION TO THE

WESTERN RAIL-ROAD.

WESTERN RAIL-ROAD.

1. Origin of the Enterprise.

The route from Boston through Worcester, Springfield and Pittsfield, was surveyed by James F. Baldwin, at the expense of the State, in 1827–8, and under commissioners of their appointment.

The commissioners recommended that the legislature should construct the road as a *State work*; but they declined.

After the Boston and Worcester Rail-road was in progress of construction, a charter was granted to N. Hale and others, dated March 15, 1833, to construct a rail-road from that, crossing the Connecticut river in Springfield, to the western boundary of the State.

Provisions. Capital stock not less than one, nor more than two millions.

After ten years from completion, a right in the legislature to reduce the rate of tolls on certain conditions.

After twenty years, legislature may purchase the road, by paying cost, and 10 per cent. net annual income.

No other rail-road to be granted from Worcester or Milbury to the county of Hampden, or from Springfield to the county of Berkshire, *within thirty years*; with power to make *branches* from the main road to any places in the towns through which the road passes, or the towns adjoining the same; also to make

a branch to the southern boundary of the State, to meet a road from New Haven and Hartford.

In 1835, private individuals made extensive surveys from Worcester to Springfield, and collected statistics of business and freight.

In June, 1835, books for subscription to the stock were opened in various parts of this State, and in New York, Hudson and Albany. Great efforts were made for several weeks, but little was subscribed.

In the autumn of 1835, public meetings were held in Faneuil Hall and other parts of the State—the patriotism of the whole community appealed to—each town was divided into districts—committees were appointed in each, and personal application made to every citizen.

In December, 1835, two millions of stock had been subscribed.

January, 1836, the Corporation was organized, and the stockholders directed an application to the legislature for aid.

April 4, 1836, the capital stock was increased to three millions, and the Treasurer of the State directed to subscribe for one million of the stock, and to pay the State's share on *each* assessment, when 75 per cent. of the *same assessment* had been paid by individuals; one-third of the Directors to be chosen by the State.

2. Progress of Operations.

Surveys by the Corporation commenced April, 1836.

October, 1836, road for twenty miles from Worcester ordered located.

Twenty miles put under contract for grading about January 1, 1837.

Twenty miles of work commenced about February 1, 1837.

1837, January, road ordered located from East Brookfield to Springfield.

" June, put under contract.

" July 1, work commenced.

Length of road from Worcester to Connecticut river, 54 miles.
Highest grade on do. (for a short distance) 50 ft. per mile.
Smallest curve, (for 1,600 ft. only,) 1,146 ft. radius.

1838, January 1, twenty-seven miles are fully graded, and ready for superstructure.

With proper means applied, 22 miles more may be graded by August 1st, and the residue in about one year from this time.

The grading is now going on, (though with reduced force,) for the whole unfinished distance, except two miles adjoining Connecticut river.

The superstructure cannot be commenced till after the winter of 1838-9, unless the timber can be contracted for and cut this winter, and means provided to pay for it.

The contracts thus far are executed within the estimates.

West of Connecticut River.

Most of the year 1836 was spent by two parties of engineers in numerous surveys; of a north route by Pittsfield, and the south route by Lee; and several months in 1837, on a re-survey of the south route.

The engineers recommended the northern route.

July, 1837, the Directors decided in favor of the northern route by Chester, Washington, Hinsdale, Dalton and Pittsfield.

These two routes were of about equal lengths, and involved about equal expense.

The north one has much less high grades, and much the least curvature.

The distance by this route, from Connecticut river to the west line of the State, is about 62½ miles.

The highest grade is 79 to 80 feet per mile.

The shortest curvature about 1,000 feet radius.

The whole is now *ready* to be put under contract.

The whole length of the road from Worcester to the west line of the State, is about 116½ miles—and is perfectly feasible for locomotive power.

From the western termination of the road to the Hudson river, two rail roads are contemplated. One to the city of Hudson, thirty-three miles, is now graded, excepting for about half a mile, and the rails are now laying down. This will be in operation Aug. 1, 1838. The other is to Albany, about 38 miles. And assurances are given that it will be commenced the coming spring, and finished before the Western Rail-road. Both these are feasible for locomotive power.

The whole distance from Boston to Albany will not exceed

200 miles, and may be travelled ordinarily in 12 hours. From Albany to Utica, 96 miles, a rail-road is in operation; and from Utica to Buffalo roads are now in progress, which will doubtless be in operation by the time of completion of the Western Rail-road, making about 500 miles of continuous rail-road to the lake navigation—or about 32 hours travel.

The New Haven and Hartford Rail-road is now constructing, and a charter is granted to extend it to the Western Rail-road at Springfield.

3. Financial Department.

The stock (20,000 shares) was originally subscribed for, by over 2,200 individuals, principally in small sums, from one to twenty shares, in various towns in eight different counties in the State, and in the State of New York.

There are now about 2,400 stockholders, mostly men of moderate property, and in active business.

In nearly every case, the subscription was made, not as an investment for profit, but as *a contribution to a great public enterprise.*

The two first assessments were collected in full before the work commenced, and the greater part of the third was collected early last year. Upon these three the State paid their share, being $150,000.

The fourth assessment was payable April 16, 1837, and on account of the pressure of the times, and the difficulty of collecting it, it was suspended till Sept. 1837.

After great labor and persevering personal applications for several weeks by the treasurer and other officers, 75 per cent. of this assessment has just been collected, and the State have now paid $50,000 thereon, making $200,000 in all.

All the officers agree, that without a prospect of extraneous aid, it will be impracticable to collect 75 per cent. on another assessment.

These four assessments make the collections about $600,000. It is estimated by the treasurer and agent, that the unexpended balance of this sum will be entirely exhausted by the payments for the work done the present month, and other outstanding claims against the corporation.

About Aug. 1837, the pressure of the times and the state of the treasury compelled a reduction of the work and of the expenditure fully one third.

Since that time the force has been gradually still farther reduced, as low as is possible, without actual loss to the contractors or the corporation.

The directors are resolved not to bring the corporation in debt beyond means at command to pay. And without further aid, they must, in the course of February, order the work to be discontinued.

4. Consequences of Suspending the Work.

The whole corps of engineers, which is of the first character for intelligence and efficiency, must be dismissed.

The contracts, mostly made when labor was low, will be relinquished, to be renewed, if ever, probably on higher terms.

The execution of the first half of each contract is by itself profitable to the contractor—as "the haul" or draught is short—the price per cubic yard being the same on the whole section. Of course the last half by itself is onerous in proportion.

If the contractor is stopped when the section is partly finished, he has full pay for the part thus done.

And when the work is resumed, the residue must be let at a greatly enhanced price.

Much of the work being finished, will get in a dilapidated state by want of care.

Most of the laborers now on the line, with their families, will be transferred to the alms-houses—at least during this winter.

If the work is entirely *abandoned*,

There will be a loss to individual stockholders of $400,000

" " " to the State of . . . 200,000

This amount of capital will be virtually annihilated.

The farms and lots on the whole line will have been cut up, to their great injury, and without benefit to any body.

Great injustice will be done to those land-owners who have given their lands for little or no compensation, and who lose the equivalent, expected to be realized by the construction of the road.

The character of the State will suffer deeply. And our citizens be discouraged from attempting hereafter any great public work.

5. GRANTS FOR INTERNAL IMPROVEMENTS BY OTHER STATES.

New York—in January, 1837, had expended upon 823 miles of Canals, over	$15,000,000
Upon other works authorized at expense of the State, ...	3,000,000
She has granted the credit of the State to the New York and Erie Rail-road for . . .	3,000,000
And authorized the enlargement of the Erie canal at an expense of	12,000,000
The Erie canal, costing over seven millions, paid for itself, principal and interest in eleven years, and in 1836 gave a net revenue to the State of . .	1,300,000
Pennsylvania—has made 961 miles of canals and rail-roads at a cost of about	25,000,000
Ohio—has made, as a State, 400 miles of canals.	
Illinois—appropriated last year to works of internal improvement	9,600,000
Maryland—in 1836 appropriated . . .	8,000,000
Virginia—up to 1836 had appropriated . .	7,500,000
Michigan—the last year granted . . .	5,000,000

South Carolina, North Carolina, Tennessee, Kentucky and *Ohio* are making liberal grants to the Charleston and Cincinnati Rail-road, 600 miles in extent.

6. ESTIMATE OF BUSINESS ON THE LINE BETWEEN WORCESTER AND SPRINGFIELD IN 1835, AS REPORTED BY THE EXECUTIVE COMMITTEE FOR SURVEYS; THE FACTS BEING COLLECTED BY FIVE OR SIX AGENTS WHO VISITED THE TOWNS PERSONALLY.

Fifty-six towns—population, ...	91,145
Number of Manufactories of all kinds, . .	189
" Stores and Ware-houses, . .	311
" Mills and Tanneries, . . .	368
Capital employed in Manufactories, . .	$6,206,500
" " Trade, ...	1,335,500
Amount of Freight transported—tons, . .	51,271

Estimated number of Passengers in 1835, between Worcester and Connecticut river, was . 55,510

The above were without facilities of rail-roads, and before the Worcester road was in operation.

West of Connecticut River.

The same Committee estimated the business between Springfield and Albany *as it was in* 1835, as follows:—

Amount of tons transported per annum, . .	38,806
Number of passengers *then* travelling per ann. .	38,565

Number tons of freight upon the Worcester Rail-road the past year—upwards, ...		18,099
down, ...		3,545
	Tons,	21,644

Total receipts for freight past year, . .	$73,044 75
" " for passengers, . . .	123,331 80
	$196,376 55

BOSTON, *January* 15, 1838.

SENATE..... .....No. 8.

MEMORIAL AND REPORT

OF THE

WESTERN RAIL-ROAD CORPORATION.

1838

MEMORIAL.

To the Honorable the Senate and House of Representatives of the Commonwealth of Massachusetts, in General Court assembled:

The Memorial of the Directors of the Western Rail-road Corporation, respectfully sheweth:

That, at a special meeting of the Stockholders held at Boston, on the 23d of November last, and very numerously attended from all parts of the Commonwealth; they were requested and enjoined, to apply to the Legislature at its present session, for a loan of the credit of the State to the Western Rail-road Corporation, for eighty per cent. on the amount of the stock by a State scrip, having thirty years to run, bearing interest at five per cent. per annum semi-annually, principal and interest payable in London to bearer, with warrants for the interest. At the same time a vote was passed authorizing the Treasurer under order of the Board of Directors, to pledge the franchise of the Corporation, together with the road and its appurtenances as collateral security for the payment of said scrip, both principal and interest. In presenting this petition your memorialists do not consider it necessary to enter into an argument as to the utility of this road, as to the duty of States carrying on public improvements at the public expense, or of the many advantages that would result directly and indirectly from granting aid in

the precise manner that is prayed for. They however consider it as due both to the stockholders and the public, to state briefly the reasons that render such assistance necessary. The importance of a rapid and easy communication between the interior of the state and the capital, and between both and the fertile regions of the West, had long been felt; and no sooner had the advantages of rail-roads been tested, than the attention of the Legislature was called to this work. The application was unsuccessful, not because the necessity of the work was doubted, but because private enterprise aided only by charters of incorporation, had been sufficient to complete every work that had been attempted; and little doubt was felt that this too, would be accomplished without legislative assistance. A charter was accordingly obtained, and subscription books were opened; but the great expense of the road—the length of time that must necessarily elapse before an income could be expected, and many other reasons, prevented the subscription from being filled. Public considerations could not induce the State, private interest could not tempt individuals to embark in the enterprise, and nothing remained but an appeal to the public spirit of the citizens. This was accordingly made. Meetings were held in the metropolis, and in the towns and villages on the line of the road. These were addressed by citizens of other States, and by the most influential men of our own. Towns were divided into districts, and the city into wards, committees were appointed in each, who almost prescribed the amount that every one should contribute; and public opinion pointed at him who refused, as at one who was unwilling to bear his individual part in a common burden, or who was desirous of reaping a great public advantage, without contributing

his proportion of the expense. Exertions like these could not be unsuccessful, and 20,000 shares were taken by about 2200 subscribers; of these as they now appear on the books of the Corporation,

1349 belong to the County of Suffolk,
70 " " Norfolk,
472 " " Hampden and Worcester,
249 " " Berkshire,

and the rest were divided among citizens of other counties; all these were bona-fide subscriptions, one of the conditions in all of them was, that 10 per cent. should be paid on each share, which was accordingly done in every case without an exception. The Legislature in 1836 increased the capital of the Corporation, and subscribed a million to its stock, this assistance, valuable as it was, gave no relief to individual stockholders; at the time they neither asked, nor needed it, but a change was at hand, and many who supposed they were independent, found they were ruined; this change was peculiarly felt by the class of men, whose energy and patriotism, had induced them to aid this important undertaking. With but few exceptions the stockholders consisted of active merchants, mechanics, farmers, and manufacturers, and among these, many have lost either their entire means of payment, or at least, the surplus that they had thus appropriated.

The subscribers in making this application do not come as representatives of speculators who have failed in an enterprize by which they had hoped to enrich themselves or their children, but of deserving citizens who have made, and are willing to make sacrifices for the public good. They do not ask to be relieved from the labor or the responsibility of constructing the road, nor from any risk arising from the ultimate success. They offer to pay

in 20 per cent. of their own money, and they ask that when they have so done, the State should, by a loan of its credit at once save them from the necessity of locking up their active means, and increase the public wealth by the introduction of a foreign capital. It may perhaps, be inquired, why an application of this nature should be made before the means of compulsion authorized by law have been resorted to. The answer has already been given; change of times has destroyed the ability of subscribers. And the directors can truly say, that they hardly know of an instance in the State, where the payment is refused on any ground, but that of absolute inability. The manner in which the assessments have been paid, notwithstanding the change of circumstances, shows the interest taken in the enterprize originally, and the necessity of efficient aid at the present time. The two first assessments were laid in a time of comparative prosperity, and were collected in full. The third was made payable on the 15th of January, 1837, and 75 per cent. was paid on the 16th day of March, enabling the corporation to claim the States' subscription on that day. The fourth was laid, payable on the 15th of April, and owing to the pressure, that preceded the suspension of specie payments, was postponed until the 25th of September. It was for a long time doubted whether such a proportion of this assessment could be collected as would enable the corporation to claim the subscription of the State. It was however done on the 2d of the present month. Great exertions on the part of the officers of the corporation, joined to a hope of aid from the Legislature at its present session, and an unwillingness on the part of the stockholders to lose the advantages of the present contracts by stopping the work for a day, were the means of effecting it.

In many cases these assessments were paid by firms, and individuals who have failed, and it is the conviction of your petitioners that unless aid is given by the State, it will be impossible to collect 75 per cent. on another assessment, which will of course involve the necessity of suspending the work. The Directors have thus stated the claim of the stockholders to assistance, arising from the manner of their subscription, and the absolute necessity of aid in order to enable them to go on with the great public work in which they are engaged. They will not occupy your time with general considerations, these have been set forth in documents that are already in your hands; they would only request an early action on this subject, and such aid as will enable them to progress with vigor in an enterprize of which every citizen acknowledges the importance.

By order of the Stockholders.

THOMAS B. WALES,
EDMUND DWIGHT,
JOHN HENSHAW,
JOSIAH QUINCY, Jr.,
AMASA WALKER,
GEORGE BLISS,
} *Directors.*

Boston, January 3, 1838.

HOUSE OF REPRESENTATIVES, Jan. 13, 1838.

Referred to Messrs. WASHBURN, of *Worcester*,
DUNCAN, of *Haverhill*,
PHELPS, of *Hadley*,
EDGELL, of *Framingham*,
IVES, of *Westfield*,

with such as the Senate may join, with instructions to cause the same to be printed.

Sent up for concurrence.

L. S. CUSHING, *Clerk.*

IN SENATE, Jan. 13, 1838.

Concurred: and Messrs. HUDSON, FILLEY, SHAW and KING, are joined.

CHA'S CALHOUN, *Clerk.*

REPORT.

To the Honorable the Senate and House of Representativ of the Commonwealth of Massachusetts:

As required by the provisions of law, the Directors of th Western Rail-road Corporation herewith present the SECOND ANNUAL REPORT.

At the annual meeting of the Corporation in Februar last, the directors of the previous year were re-electe with the exception, that Francis Jackson having decline the office, Amasa Walker was chosen in his stead.

At the date of the last report to the Legislature, th eastern portion of the line, between the village of Wo cester, and Seven-mile river in East Brookfield, was u der contract, and in process of grading. During the pa year, this work has been steadily prosecuted—the gradin of about sixteen miles has been completed, and that upo the residue is in a good state of forwardness. The d rectors are confidently of opinion, that, with an applica tion of means, not inconsistent with a prudent econom of expenditure, the whole of this part of the road, wit the exception of one mile at New Worcester, and on mile at the summits in Charlton, may be graded an ready for the superstructure, by mid-summer of the pre ent year, and that the section at New Worcester may b

finished by the first of November next, and that at the summit by the succeeding spring.

From East Brookfield to the Connecticut river, the route adopted is in the general course of the valley of the Chickopee river, as far as to Stony hill, in Wilbraham; thence it crosses the plains which skirt the Connecticut valley on the east, to the head of Garden brook, and passing down this brook, the line strikes the Connecticut river about half a mile above the court-house in Springfield. In its course, it passes south of, and near to, the villages of South and West Brookfield, through the village of Warren, about two miles south of Three Rivers village in Palmer, and near the Ludlow factories.

From Stony hill to the river, a distance of about seven miles, four routes were surveyed. And these were continued to a proper point of union, west of the river. 1. Crossing the river at Cabotville, by the mouth of the Chickopee, and about four miles north of the court-house. 2. By End brook about one and three-quarter miles north of the same point. 3. By Garden brook, and 4, by the valley of Mill river in the southerly part of Springfield. The line by Garden brook, being the least expensive, and with the most favorable grades, was, on the recommendation of the engineers, adopted by the directors.

The whole of the line from East Brookfield to the Connecticut river, was definitely located, and, with the exception of about two miles adjoining the river, was put under contract for grading in the month of June last, upon favorable terms. The work of graduation was soon after commenced upon the greater portion of it, and it has been continued to the present time, as vigorously as a prudent regard to the state of the times would admit.

Of this portion of the road, being about 34 3-4 miles,

about 11 miles are already graded, and the residue is advanced in a manner satisfactory to the directors. Should no unfortunate obstacle delay the progress of the work, it is confidently believed, that, excepting one mile at Twelve-mile brook in Wilbraham, and two miles adjoining the Connecticut river, this part of the road may be graded, and ready for the superstructure by next autumn, and it is estimated that those three miles may be graded during the succeeding winter.

Thus it appears, if these reasonable expectations are not disappointed, that, of the road from Worcester to Springfield, being about 54 miles, there are already

graded,	27	miles;
that by mid-summer there will be graded,	21	"
by 1st of November next,	1	"
and by the spring of 1839, the residue,	5	"
	54	miles.

A reference to the last annual report will shew, that, at the date of it, (January, 1837,) very extensive preliminary surveys had been made between Connecticut river and the western boundary of the state. Those surveys had pointed out two general routes in competition for preference.—A *northern* one, by Chester, Dalton and Pittsfield—and the southern by Otis, Lee and Stockbridge.

By the character of the country on the northern line, we are virtually confined to one general route. And this having been previously traced by Mr. Baldwin, whose maps, profiles and reports were in possession of the engineers, preliminary surveys were there unnecessary; and they had proceeded directly with an approximate location. The surveys upon the south route had been over a wide

extent of country, from Becket on the north, to Granville and Tolland on the south; and they were experimental only. Upon the completion of the maps and profiles, it was deemed advisable, as intimated in the former report, to select the lines upon the southern route, most favorable for a continuous one from Westfield to West Stockbridge, and make an approximate location there; thus placing both routes, in this respect, upon the same footing. This additional work was accomplished, and a report made by the engineers, in June last, embracing full details of the approximate location upon both routes.

By an examination of this report, it was ascertained, that the difference in the length of the two routes, and in the estimated expense of construction, was comparatively trifling, being each a little in favor of the south route—that the principal summit was 51 feet higher, and the aggregate elevation of all the summits, 113 feet more, upon the south, than upon the north route, which would give a difference, in the *equated distance*, of 5.28 miles in favor of the north line—that the whole curvature was 390 degrees greater upon the south route, than upon the north —that of grades over 50 feet per mile, there were 8.3 miles more upon the south than upon the north route.

Upon the receipt of this report, the directors, at the request of the friends of each route, gave them a hearing; and, after a full consideration of the subject, and an examination of the lines by a part of the board, they, in August last, decided in favor of the northern route, through Pittsfield, and ordered the same to be definitely located. The board, however, reserved for future decision,—on the coming in of the report of the definite location, three points, which are still undetermined, viz., the direction of the lines through the villages of Westfield

and Pittsfield, and the western termination of the road, either at the Canaan Gap in West Stockbridge, or at Hatch's Gap in Richmond, which are about 2 2-3 miles apart.

At the Canaan Gap, the road would unite with the Hudson and Berkshire road, which extends to the city of Hudson. This is already fully graded, with the exception of a short distance, requiring a few weeks more work, and the superstructure has been commenced. The superintendent gives assurance, that the whole will be in operation before the close of the next summer.

The Albany rail-road *may* also terminate at the Canaan Gap in West Stockbridge. Indeed, no other route was suggested for it, till within the last year. But, since the date of our last report, the superintendent of that road has asked attention to the route from Pittsfield, by Hatch's Gap in Richmond, and thence by New Lebanon to Albany. It is represented, that this route, if practicable, will save about six miles in the distance between Pittsfield and Albany. Of the practicability of that part of the route, which is *within the state of New York*, at a reasonable expense, satisfactory evidence has not been exhibited. But as soon as it was decided, that the route of our road would be by Pittsfield, a survey was had from thence to Hatch's Gap. The line, so far as *within this state*, was found to be favorable, and with light grades, and to be about 2 1-3 miles shorter than that to the Canaan Gap.

The directors regret that nothing effective has yet been done, towards the construction of the Albany road. Indeed, as has been intimated, the route of that road is still undecided. But after repeated solicitations and conferences, and a recent visit of the agent to Albany for the purpose, the directors of that company have now engaged

to give an early decision, as to their general route, and the point at which they desire to strike the state line.

The definite location of our road from Connecticut river to the state line, has now been completed; and the final maps, profiles and estimates of the same are in progress. These are not sufficiently advanced to permit the results now to be given. But it is believed, they will not differ materially from those upon the approximate location, made nearly upon the same line.

The report of the engineers upon this definite location, may be expected in a few weeks. Upon its receipt, the directors will be ready to decide upon the lines at the Westfield and Pittsfield villages, and upon the course of the road westward of Pittsfield, as well as upon the question of its union with the Albany and Hudson roads. And it is believed, that, before the opening of the coming spring, the whole line, from Springfield to the boundary of New York, may be ready to be put under contract for grading.

The directors are deeply impressed with the importance of commencing this part of the work early in the next season, and, should adequate means be provided for the expenditure, they see no obstacle to its immediate prosecution. The necessity of this course is strongly urged by the fact, that, by the terms of the original subscription to the stock, the road from Pittsfield to the state line, must be *completed* as early as that part between Worcester and Springfield. And, unless the former can be far advanced during the present year, the state of it may require an unnecessary and very injurious delay upon the latter. The directors, therefore, will omit no reasonable exertion to commence the grading westward of Pittsfield as early as is practicable.

Six assessments of five dollars each have been laid upon the stock. The two first had been fully paid at the date of the last report; the third was then in process of collection, and the fourth had been laid payable on the 17th of the succeeding April. Owing to the extraordinary pecuniary embarrassments which existed at the latter date, the directors deemed it prudent to postpone the collection of the fourth assessment to the 25th of September last. During the past year, a fifth assessment was laid, and it became payable on the 15th of November last, and the sixth will fall due on the 25th day of January instant.

The receipts and expenditures of the corporation for the year past, as stated by the treasurer, are as follows, viz.:

1. Receipts.

Balance on hand as per last report, Jan. 14, 1837,		$262,602 44
Am't since rec'd on 3d instal't,	$133,985 00	
" 4th "	*75,100 00	
" 5th "	28,830 00	
" 6th "	720 00	
Interest rec'd since last report,	14,143 60	
		252,778 60
		$515,381 04

* Exclusive of $50,000 due from the State.

2. Expenditures.

Amount paid for incidental expenses,	$4,681 34
" for engineer department, including surveys and superintendence of construction,	35,214 33
Amount paid for construction,	363,490 39

Amount paid for land damages and fencing,	40,292 81
" timber lands,	1,812 50
Balance on hand,	69,889 67
	$515,381 04

Respectfully submitted.

THOMAS B. WALES,
ROBERT RANTOUL, Jr.,
EDM. DWIGHT,
JOHN HENSHAW,
JOSIAH QUINCY, Jr.
AMASA WALKER,
GEO. BLISS,
} *Directors.*

Boston, January 2d, 1838.

SUFFOLK ss. JAN. 3, 1838.

Sworn to,

Before me,

ELLIS GRAY LORING,

Justice of the Peace.

HOUSE OF REPRESENTATIVES, Jan 13, 1838.

Referred to the Committee on a Petition of the Western Rail-road Corporation, with instructions to cause the same to be printed.

Sent up for concurrence.

L. S. CUSHING, *Clerk.*

IN SENATE, Jan. 13, 1838.

Concurred.

CHARLES CALHOUN, *Clerk.*

(6)

Mass. General court. Joint select committee
" on the Western railroad

HOUSE..... .....No. 17.

REPORT

TO

AID THE CONSTRUCTION

OF THE

WESTERN RAIL-ROAD.

1838

Commonwealth of Massachusetts.

HOUSE OF REPRESENTATIVES, Feb. 3, 1838.

The Joint Select Committee, to whom was referred the Memorial of the Directors of the Western Rail-road, have had the same under consideration, and submit the following

REPORT:

The history and objects of the enterprise which has been made the subject of their examination, when considering the Memorial of the Directors of the Western Rail-road Corporation, are believed to be too familiar to the Legislature to require an exposition of them by the committee. They may, however, briefly remark, that the first act incorporating said company was passed on the 15th March, 1833. The capital stock contemplated to be created by that act was not to exceed two millions of dollars. On the 4th April, 1836, an increase of the capital stock of the company was made, by an act of the Legislature, to the amount of three millions, of which the Commonwealth, by the same act, were to become subscribers to the amount of one million of dollars.

By an act passed on the 15th April, 1837, provision

was made for the issuing of scrip, as a means of raising the necessary funds to meet this subscription on the part of the state, and for creating a sinking fund, whereby the loan thus created should be repaid.

The direction of the work was committed to a board of nine, of whom three were to be annually elected on the part of the Commonwealth.

Of the capital stock, two millions had been subscribed by private stockholders as early as December, 1835, and in January, 1836, the corporation was organized by a choice of its officers. Surveys were prosecuted, preparatory to the commencement of the work, and in February, 1837, the work of constructing the road was begun. Since that time, the whole road between Worcester and Springfield, a distance of fifty-four miles, has been put under contract, and twenty-seven miles of it have been already graded ready for the superstructure. Besides this, surveys have been prosecuted, and the road has been located, between Connecticut river and the western line of the state, except for a short distance at its western termination, which, for satisfactory reasons, has been left undetermined.

The committee are satisfied, that the business of surveying, letting out and constructing the road, has thus far been prosecuted with all due diligence and fidelity.

Four instalments, of five dollars each, have been assessed upon the stock of the company, and such proportion of it has been collected, that the instalments payable by the state upon this proportion of its stock, have been paid, making the whole sum paid by the state, $200,000, while the amount of the four instalments upon the stock of private stockholders is $400,000.

The committee have been satisfied, that all the money

already paid in, will have been expended upon the surveys and construction of the road, and other necessary accompanying charges, by the first of March, 1838.

They are satisfied, too, that, from the present difficulties and embarrassments under which men of business are laboring, and the general derangement of the fiscal concerns of the country, it is impossible for the directors to collect from the holders of the capital stock of this corporation, the means of prosecuting the work of constructing their rail-road for any reasonable length of time, and that, without the aid of loans, they will be compelled to abandon the enterprise.

Under these circumstances, the directors have petitioned the Legislature to grant them the loan of the credit of the Commonwealth, for the purpose of raising the necessary funds wherewith to prosecute the work of constructing their road.

The Committee have referred to these facts, although they are substantially before the Legislature already in the Memorial of the Directors, for the purpose of expressing their belief in the correctness of the statements of the directors.

The questions to which the minds of the committee were directed were,

1. If such a loan were necessary?

2. If so, to what extent it was necessary?

3. Could a loan to the necessary extent be made and the Commonwealth be rendered secure from loss?

4. Whether it is expedient for the Commonwealth that the application for the loan to an extent necessary to construct the road should be granted?

Upon all these questions it is understood that the com-

mittee have come to conclusions which are substantially embraced in the bill which accompanies this report.

Of the necessity of the corporation being aided by a loan in order to their prosecuting the work beyond the present month, or a few days further, the committeehave no reason to doubt.

As to the extent of this loan, the petitioners prayed in their memorial for a sum equal to 80 per cent. upon their capital stock, or $2,400,000. The committee felt disinclined to extend the proposed loan so far that the property of the corporation, which they proposed to pledge as security for such loan, should not be a reasonable indemnity against loss on the part of the state, and they finally concluded, that 70 per cent. or $2,100,000 would be as large a sum as they could be willing to recommend to the Legislature.

It may be here observed, that the sum here proposed as a loan, covers the amount of the state's subscription to the stock, the state being in fact a corporator of that company, and lending its name as endorser or guarantor for the corporation, to effect the requisite loan from foreign capitalists.

As to the security which the Commonwealth will receive against loss by the pledge to be made of the road and its appurtenances, the committee are aware that there may be a difference of opinion. But, from the best examination they have been able to make, they believe the loan may be safely made under the restrictions and limitations fixed in the accompanying bill.

The committee are unanimous in the opinion that it would not be good policy for the Commonwealth in any event to become the owner and manager of a work like the Western Rail-road. They were therefore the more

careful in their inquiries upon this part of the subject committed to them, and the more cautious in coming to a conclusion upon it.

It will be recollected that $675,000 will have been paid upon the capital stock, and chiefly expended upon the road before any considerable part of the loan will be advanced to the corporation. There cannot be a second instalment of the loan called for, until two-thirds of the former one shall have been expended upon the work, and thus the moneys, advanced from time to time, are required to be expended in increasing the value of the pledge which the state will hold. Add to this, the provision which is made for a sinking fund, will be diminishing the amount for which the state shall be holden, at a rate which many believe, and demonstrate by calculations, will discharge the whole liability of the Commonwealth by the end of the time for which the loan is to be made, provided the corporation keep down the interest upon the principal loaned, as they are to be bound by their bond and pledge of the road and franchise, to do.

Another guaranty for the completion of the work by the corporation, is believed to exist in the character of the holders of its stock. They are numerous; scattered through the Commonwealth along the line of the road, and in the city of Boston; have a personal interest, to a greater or less degree, in prosecuting and accomplishing the work; and in no instance that has come to the knowledge of the committee, did they become stockholders with a view of speculating in the stock of the company.

The committee would repeat, that, upon this part of the subject committed to them, they bestowed much examination and reflection. They would not recommend

the State in any event to assume the road, unless it should prove to be necessary for the security of the Commonwealth, and they have therefore been the more anxious to satisfy themselves that the work, if prosecuted, will be carried on and completed by the private stockholders; and to the solemn assurances of the directors of their entire confidence that such will be the case, the committee add their own belief that the loan may, in respect to security for its re-payment, be safely made.

Upon the last point of their inquiry, viz., the expediency of the Commonwealth making the loan if it can safely be done, the committee entertain no doubt.

They regard the work as one of the first importance to the Commonwealth. Such is the progress of improvement at the present day that Massachusetts *cannot afford* to be without this work. Its accomplishment is identified with her present well being, and future progress and prosperity. It is now twelve years since this enterprise was conceived, and it has been gaining confidence every year. In the mean time important improvements in the construction and use of rail-roads have been made, till they have become all but essential to the profitable prosecution of the business of a country. They have given a new impulse to the arts and manufactures of England; they are in the progress of introduction upon the continent of Europe, as the avenues of its internal trade and commerce. And in our own country the extent to which they have been adopted, and are now in progress of construction, leaves it no longer problematical whether they can be dispensed with by any portion of the community, whose prosperity depends upon agriculture, manufactures, or the mechanic arts.

Such is the obvious connexion of trade and commerce

with agriculture and the arts, that they necessarily seek those channels and outlets which offer the greatest facilities. Industry and enterprise will seek employment where it is the most sure of an adequate return. And while five, at least, of the principal Atlantic States, are opening from the seaboard artificial lines of communication with the rich and fertile regions of the west, can Massachusetts safely remain inactive in regard to her own trade and resources? She cannot, for the reasons already referred to, remain stationary; she must go forward, or her course will be retrograde. The recent returns of the business and wealth of this ancient Commonwealth are indeed unspeakably gratifying. They show the triumph of art and enterprise over the adverse influences of soil and climate, and present, in bold relief, the influence of the habits of her people and of her institutions, of which her citizens may be justly proud.

Yet it is not difficult to see, that the same determined persevering industry, enterprise and skill which created these resources are still to be exercised to preserve them. If prompted by hopes of greater gains, her sons should seek employment elsewhere; if, by the introduction of new improvements and increased facilities in other parts of our country, the arts, and with them, the commerce which have made Massachusetts what she is, shall seek a home in more favored regions, it is not difficult to anticipate the consequences. Works, like the one under consideration, must be created to preserve our prosperity, and what is more, they must keep pace with those of other states, or a diversion of our trade may and must be the consequence.

If the enterprise must now be arrested for a want of confidence in the Legislature in its successful accomplish-

ment, it is not difficult to see that the consequence must be an entire sacrifice of the enterprise. It can hardly be supposed that individual capitalists will be found willing again to embark in a work towards which the State shall refuse to lend even the collateral guaranty of its credit, when it must be obvious that the work has a greater reference to the public good than the emolument of its private stockholders.

The Western Rail-road is more decidedly a state enterprise than any other that is now before the public. It addresses itself to the favorable consideration of every part and portion of the body politic. It asks, for the accomplishment of this public work, the temporary accommodation of the public credit; and promises in return, a guaranty of a still richer reward to industry and enterprise, than that which has raised Massachusetts to the enviable height which she now holds among her sister states.

All which, together with the accompanying bill, is respectfully submitted.

Per order,

EMORY WASHBURN.

Commonwealth of Massachusetts.

In the Year One Thousand Eight Hundred and Thirty-Eight.

AN ACT

To aid the construction of the Western Rail-road.

BE *it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows:*

SECTION 1. The treasurer of the Commonwealth is hereby authorized and directed to issue scrip or certificates of debt in the name and in behalf of the Commonwealth, for the sum of two millions, one hundred thousand dollars, which may be expressed in the currency of Great Britain, and shall be payable to the bearer thereof in London, and bearing an interest of five per cent. per annum, payable semi-annually in London, on the first days of April and October, with

warrants for the interest attached thereto, signed by the treasurer; which scrip or certificates shall be redeemable in London at the end of thirty years from the date thereof; and in no case exceeding thirty years from the first day of April in the year one thousand eight hundred and thirty-nine, and shall be countersigned by the governor of the Commonwealth, and be deemed a pledge of the faith and credit of the Commonwealth, for the redemption thereof. And the treasurer of the Commonwealth, shall, under the conditions herein after provided, deliver the same to the treasurer of the Western Rail-road Corporation, for the purpose of enabling said corporation to complete the Western Rail-road.

Sec. 2. When the said corporation shall have received, to be expended in the construction of said road, the one half of the fifth assessment of five per cent. upon the stock held by private stockholders, and shall have filed a certificate thereof in the office of the treasurer of the Commonwealth, signed by the directors of said corporation, then the said fifth assessment on the shares of said stock owned by the Commonwealth shall be paid, any thing in the "act in aid of the Western Rail-road Corporation," passed April fourth, in the year one thousand eight hundred and thirty-six, to the contrary notwithstanding. And the scrip or certificates of debt for the one half of the amount authorized by the first section of this act, shall be thereafter delivered to the treasurer of said corporation. And when the said corporation shall have received, to be expended as aforesaid, upon the said fifth assessment, seventy-five per cent. of the amount thereof due from the private stockholders, and

also upon the sixth assessment of five per cent. upon their stock, seventy-five per cent. of the amount thereof so due from the private stockholders, and shall have filed a certificate thereof as aforesaid, then the said sixth assessment on the shares of said stock owned by the Commonwealth shall be paid, and the scrip or certificates of debt for the remaining part of the amount thus authorized, shall be thereafter delivered to the treasurer of said corporation: *provided, however*, that said scrip shall not be thus delivered in larger sums than three hundred thousand dollars at one time; and after the delivery of the first three hundred thousand dollars of said scrip, the residue thereof shall not be delivered to said treasurer, until it shall be made to appear, to the satisfaction of the governor and council, that at least two thirds of the proceeds of the scrip previously delivered, shall have been faithfully expended or appropriated for the construction of said road, or providing engines, cars and other appurtenances thereof. And if said corporation shall give security, to the satisfaction of the governor and council, for the payment of any part of the assessments, in this section required to be made, such security shall be deemed to be equivalent to the payment of the amount so secured.

SEC. 3. The premium or profits on the sales of said scrip or certificates of debt, shall, when received, be paid by said corporation to the treasurer of the Commonwealth; and after the said road shall be opened for use, a sum equal to one per cent. on the amount of said scrip thus issued, shall be annually set apart from the income of said road, and paid to said treasurer; and the whole thereof shall be by him

placed at interest, and the same with the interest annually accruing thereon, shall constitute a sinking fund for the future purchase or final redemption of said scrip.

Sec. 4. The said corporation shall, during the year one thousand eight hundred and thirty-eight, and as soon as the same can conveniently be done, commence the construction of such part of said road lying between Springfield and Pittsfield, as will require the longest time for its completion, and prosecute the same in such manner as to secure the completion of the whole road from Springfield to the western line of the state, as early as is practicable with a due regard to economy. And no part of the funds of said corporation shall be appropriated to the construction of any branch of the road, until the completion of the main line thereof. But if the directors judge it best for the interest of the public and of the corporation, they may construct, or authorize others to construct under them, a branch from their main road to the village of West Stockbridge.

Sec. 5. No part of said scrip shall be delivered to the treasurer of said corporation until said corporation, at an annual meeting, or at a special meeting duly notified for that purpose, shall have assented to the provisions of this act, and shall have executed to the Commonwealth a bond, in such form as the attorney general shall prescribe, conditioned that said corpora- shall comply with the requisitions of this act, and shall faithfully expend the proceeds of said scrip in the construction of their road, and shall indemnify and save harmless the Commonwealth from all loss or inconvenience on account of said scrip or certificates of

debt, and that said corporation shall and will pay the principal sum of the said scrip or certificates which may be delivered to their treasurer, punctually in London, when the same shall become due, or such part thereof as the sinking sum aforesaid may prove insufficient to pay, and the interest thereon, semi-annually, in London, as the same shall fall due; and shall also convey to the Commonwealth, by a suitable instrument to be prepared for that purpose, under the direction of the attorney general, their entire road, with its income, and all the franchise and property to them belonging, as a pledge or mortgage to secure the performance of all the conditions of said bond: *provided*, that the Commonwealth shall not take possession of said pledged or mortgaged property, unless for a substantial breach of some condition of said bond.

SEC. 6. Nothing in this act contained shall be construed to impair or lessen the right of the Commonwealth to purchase the said rail-road, and all the franchise, property, rights and privileges of said corporation, on the terms and conditions contained in their act of incorpration.

SEC. .7 This act shall take effect from and after its passage.

(7)

Mass. General court. Joint select committee on the Western railroad.

SENATE..... .....No. 28.

REPORT

CONCERNING

STATISTICAL INFORMATION

IN RELATION TO THE

WESTERN AND OTHER RAIL-ROADS.

1838

Commonwealth of Massachusetts.

House of Representatives, Jan. 15, 1838.

Ordered, That the committee to whom was referred the petition of the Western Rail-road Corporation be directed to prepare, (A) and report to this House, a statement of the amount of stock in said corporation now held by the citizens of Boston, and also the amount held by the inhabitants of the several towns in this Commonwealth, (B) respectively through which the rail-road is to pass, (C) likewise the amount held by individuals not inhabitants of this state and that they be directed to report further, the *estimated* cost of the Providence, Worcester, and Lowell rail-roads respectively, when application was made to the Legislature of this State for leave to construct those roads, and also the *actual* cost of each of them, with the reasons for the difference between the estimated and actual cost in those cases.

Sent up for concurrence.

L. S. CUSHING, *Clerk.*

In Senate, Jan. 17, 1838.

Concurred, with the following amendments: Strike out at A the words, "and report to this House"—strike out all the words between B and C; and in their stead insert, "and the number of stockholders."

Sent down for concurrence.

CHA'S CALHOUN, *Clerk.*

House of Representatives, Jan. 19, 1838.

Concurred.

L. S. CUSHING, *Clerk.*

Commonwealth of Massachusetts.

In Senate, Feb. 5, 1838.

The Special Joint Committee to whom was referred an order of the 15th ult., directing them to collect certain statistics in relation to the Western, Lowell, Providence and Worcester Rail-roads, have attended to that duty, and submit the following

REPORT:

The committee will so far deviate from the arrangement of the order, as to comply with the last requisition first. The Lowell Rail-road was chartered June 5, 1830, with a capital of $500,000. The original estimate of the road was, however, $673,000. It appears by the sixth annual report of the corporation, that they have expended $1,500,000, being more than twice the original estimate, and three times the amount of capital stock created by their charter. The reasons for this increase of expenditure are various, some of which we shall state. The charter did not authorize the corporation to cross Charles River. In March 1832, they came to the Legislature and obtained an additional act granting them that authority; this must have added materially to the ex-

pense. Another important consideration is this:—when this charter was granted, the experiments of steam engines had not been made. It was not certain at that time whether horse or steam power would be employed. Their charter seemed to contemplate horse-power, and also that the road would be used by the public like turnpike roads. But it was soon found expedient to use steam power, thereby increasing materially the expenditures of the corporation. It appears by their last report that the engines and cars have cost $111,037. In consequence of owning the motive power, they have expended for depots and their appertenances, the sum of $82,166, nearly the whole of which could have been dispensed with, if the road had been used by the public as turnpike roads are.

The road itself is essentially different from what was at first contemplated. In the original survey and location the engineer admitted inclinations of 26 feet per mile, and the road thus located corresponded very nearly with the surface of the ground, thereby saving great expense in excavations and embankments. But when the location was actually made, they resolved to reduce the inclination to 10 feet per mile; thereby increasing very materially the amount of excavation and embankment. Not only the road-bed, but the superstructure is essentially different from what was originally contemplated. When the the first survey was made, the iron was estimated at 16 tons per mile; but some part of the rails that have been used on that road, have actually exceeded, independently of the fastenings, 90 tons per mile. The increase of the weight of the rail and of the excavations have added to the expenditure, $250,000. The land damages were not included in the original estimate; these have amounted to $74,000.

These are some of the causes which have increased the cost of that road. But it should be remembered that the road is altogether a different thing from what was at first contemplated,—it is a most permanent structure, and will need but little repairs for years to come. But if the road has exceeded the estimate, the same is true of the amount of business on the road. When the charter was asked for, the petitioners estimated the number of passengers at from thirty to thirty-seven thousand per year, but during the two past years, the passengers have exceeded 115,000 annually. The business on this road has exceeded the estimate by a greater per cent. than the cost of the road.

The Providence road has cost $1,153,000. The estimated cost of the road in 1832, was 769,000, simply for the excavation, embankment and railings. This was exclusive of land damages, which have amounted to $204,000; of the stone viaduct in Canton, which cost $92,000; of making the road through the Receiving Basin, in Boston, $60,000; of bridges not originally contemplated, $56,000; of Dedham Branch, $35,000. Here is an amount of about $450,000. Add to this the iron-rail being larger, has cost $31,000 more than was anticipated. The corporation have also encountered several rock excavations of great depth and extent, which have increased the expenditures more than $100,000. The expense of surveying, agencies, &c., have cost $100,000 more. The remarks made upon the Lowell road will apply to this, and show why the expenditures have exceeded the estimates.

The Worcester road was estimated at 1,000,000 of dollars, and has cost $1,518,000. This estimate contemplated the depot at Charles street, in the westerly part of

the city; but it has been extended to tide water on the easterly part of the city, with an additional cost of $113,000; 62,000 dollars have also been expended in the purchase of engines and cars more than was at first contemplated. They have expended in depot buildings more than was originally contemplated, $75,000. They have constructed a branch road to Millbury, at a cost of $41,000. These are some of the reasons why the cost has exceeded the estimates. We may remark here as in the other cases, that the road has been constructed in a more expensive manner than was at first contemplated. It has also been found by experience that the items of land damages, and depot accommodations have cost more than was anticipated, owing to the greater amount of land and buildings, than was supposed necessary at first. But it will also be found true, that the business of the several roads has exceeded the estimates as much as the cost of the road and its appertenances.

Nor is it at all strange that these structures have exceeded the original estimates. At the time these estimates were made, there had been no experiment made in this part of the country. The most experienced engineers at that time, could not anticipate all the items of expense, or the amount of accommodation required at the depots. Engineers at the present day, are very differently situated. With the knowledge they now possess—with the light which experience has shed upon this subject, they can approximate much nearer the real cost of a road, than it was possible for them to do, when the roads abovementioned were chartered. The recent estimates have provided for more engines and cars, and greater depot accommodations, than was provided for in the estimates made when our first roads were chartered.

The order also called for a list of the stockholders of the Western Rail-road Corporation, which list is appended to this report.

For the Committee,

C. HUDSON.

WESTERN RAIL-ROAD CORPORATION.

A STATEMENT *of the number of Stockholders and the number of Shares in the several Towns in Massachusetts and elsewhere, Jan. 20, 1838.*

TOWNS.	Stockholders.	Shares.	TOWNS.	Stockholders.	Shares.
Boston, . .	1,330	15,124	Pepperell, . .	1	4
Charlestown, .	48	144	Brookfield, .	58	179
Cambridge, . .	11	58	North Brookfield,	7	22
Roxbury, . .	57	354	Westfield, . .	51	114
Dorchester, . .	2	15	Brimfield, . .	1	1
Worcester, . .	6	27	Amherst, . .	1	2
Waltham, . .	1	5	Belchertown,	1	1
Quincy, . .	1	5	Russell, . .	1	1
Lynn, . . .	4	24	Pittsfield, . .	120	273
Princeton, . .	1	5	Hinsdale, . .	42	63
Tukesbury, . .	1	2	Dalton, . .	8	18
Wrentham, . .	1	5	Lanesboro', .	40	60
Brookline, . .	2	6	Becket, . .	1	1
Marblehead, .	5	145	Peru, . . .	7	7
Bridgewater, .	1	5	Washington, .	3	3
Milton, . .	2	15	Richmond, . .	1	10
Plympton, . .	1	10	Lee, . . .	12	97
Marlboro', . .	1	1	Stockbridge, .	9	110
Springfield, . .	309	1,661	New York, .	9	314
West Springfield,	22	99	Albany, . .	25	530
Long Meadow, .	12	74	Portland, Me. .	1	20
Monson, . .	21	76	Bloomfield, Ct. .	1	3
Palmer, . .	20	43	Claremont, N. H.	1	1
Wilbraham, .	22	50	Western States, &c	11	29
Ludlow, . .	5	61			
Leicester, . .	2	4		2,331	20,000
Warren, . .	31	119			

(8)

THIS HIGHLY IMPORTANT

REPORT

UPON THE

FINANCES

AND

INTERNAL IMPROVMENTS

OF THE

STATE OF NEW-YORK,

1838,

IS REPRINTED FOR THE BENEFIT OF THE FRIENDS

OF THE

WESTERN RAIL-ROAD.

Boston:
REPRINTED BY
DUTTON AND WENTWORTH,
11 AND 12, EXCHANGE STREET.
1839.

Extract from the Annual Message of Governor SEWARD, *to the Legislature of New York, January* 1, 1839.

"I respectfully refer you to a Report of a Committee of the last House of Assembly, in which this subject (Internal Improvements) is discussed, with eminent ability, and which results in shewing that the Canals are a property substantially unincumbered; that their productiveness would warrant the State in expending, in Internal Improvements, $4,000,000 annually, during a period of ten years; and that the Revenues of the Canals alone, would reimburse this expenditure, previous to the year 1865. This sum far exceeds any estimate of the expense required to complete the entire system, while it is not to be doubted that the parts yet to be constructed will eventually be productive of Revenue. THE CONCLUSIONS OF THIS REPORT, *although of vast interest to the State, and I trust decisive of its Policy*, HAVE NOT BEEN QUESTIONED."

Such, is the language of Governor Seward, in relation to the highly important Report herewith presented, for the consideration of the People of Massachusetts.

New York (State) Legislature. Assembly. Committee on ways and means.

REPORT

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UPON THE

FINANCES

AND

INTERNAL IMPROVEMENTS

OF THE

STATE OF NEW-YORK.

1838.

REPRINTED AT BOSTON,

BY DUTTON AND WENTWORTH,

NOS. 10 AND 12, EXCHANGE STREET.

STATE OF NEW-YORK.

On the 12th of March, 1838, MR. SAMUEL B. RUGGLES, *Chairman of the Committee of Ways and Means, of the Assembly of the State of New-York, submitted to the House the following*

REPORT

on the United States Deposite Fund, and on the recommendation of the Comptroller to levy a direct tax.

MR. RUGGLES, from the standing committee of ways and means, to whom were referred so much of the annual message of his excellency the Governor, as relates to the surplus revenues of the United States deposited with this State, and also the annual report of the Comptroller, upon the finances, begs leave, in respect to that portion of the message, and also in respect to that portion of the Comptroller's report which recommends the imposition of a direct tax, to submit the following REPORT:

That under the act of Congress, passed June 23, 1836, which directed the surplus moneys in the

treasury of the United States, beyond the amount of five millions, to be deposited with the several States, the sum of $3,974,520 71 has been paid over to this State, being three-fourths of the moneys which it was entitled to receive under that law. By virtue of the subsequent act of Congress, passed October 2, 1837, which directed the transfer of the remaining fourth to be postponed until the first day of January, 1839, the residue of those moneys, amounting to $1,338,000, has hitherto been withheld; and whether it will be paid at the time specified in that act, may for the present be regarded as doubtful. Serious differences of opinion have prevailed in respect to the expediency of thus depositing the surplus revenue with the States; and if the sentiments of those who believe it more politic for the federal government to retain it, shall happen to prevail, the fourth instalment may possibly be permanently withheld from this State.

It is not, however, reasonably to be anticipated, that the money already received will be withdrawn. The act of June 23, 1836, which directed the deposite to be made, declared that when the money, or any part of it, "should be wanted by the Secretary of the Treasury of the United States" to meet appropriations by law, it should be called for upon certain notice mentioned in the act; but the subsequent law of October 2, 1837, provided that the amount thus deposited should

remain with the States, "until otherwise directed by Congress."

It cannot be deemed probable, that a majority of the States represented in the National Congress, will direct the withdrawal of these moneys. Whatever may have been the literal provisions of the law, directing these moneys to be "deposited" with the States, the intention of those who passed it evidently was to secure a permanent distribution, and not a temporary loan of the surplus revenues. In fact the doctrine on that subject, as it was first advanced by President Jackson himself, plainly contemplated an irrevocable appropriation. In his message to Congress, in 1829, he declared that "the most safe, just, and federal disposition which could be made of the surplus revenue, would be its apportionment among the several States, according to their ratio of representation:"—and in the message of the subsequent year, he removed all doubts as to his intention in that respect, by stating, that in his prior message, he had felt it to be his duty "to recommend the adoption of some plan for the *distribution* of the surplus funds among the States, in proportion to the number of their representatives, to be applied by them for objects of internal improvement."

The sentiments thus promulgated at Washington, were distinctly responded to and adopted by the Governor of this State, in his annual message

to the Legislature, in the year 1830; in which, after speaking of the funds to be derived from the surplus revenue, as "applicable to the extension of our public works," he says that "there can be no valid objection to the distribution of the surplus revenue among the States, to be disposed of at their discretion." The same chief magistrate, in the succeeding year 1831, after stating that one of his most distinguished predecessors (Governor Clinton,) had alluded to the same subject in his message in 1827, renewed the suggestion contained in his former communication; and pressed it earnestly upon the consideration of the Legislature. A committee of the Senate in the same year, reported that in their judgment, the proposed distribution was "a matter of the first importance;" and for the reason, among others, that it would enable the State, in prosecuting her works of internal improvement, "to satisfy the just claims of all her citizens." The committee fully concur in the soundness of the opinions thus expressed, in respect to the distribution of these moneys; and in their judgment, the receipt by this State, of the large sum of $3,974,520 71 thus allotted to it, whatever may be the opinions of those who doubt the expediency of the measure, ought to be a subject of unmixed congratulation.

Without pretending to question the obligation of this State to repay the money thus deposited, whenever it shall be legally demanded by an act of

Congress, it may nevertheless, be assumed that no reasonable probability exists that it will ever be thus demanded. Of the several states which have received their respective portions, amounting in the aggregate to nearly forty millions of dollars, the greater number have already appropriated it to objects of a permanent nature, from which it cannot be withdrawn without serious injury and inconvenience. Many of the States have expended it in works of internal improvement, or in paying debts previously incurred for that purpose. In some instances it has been loaned to their citizens; while one example, at least, is presented, in which it has been actually distributed, numerically, among all the inhabitants of the State. In nearly all these instances, the repayment of the money, if called for by Congress, will become inconvenient and oppressive to the people of those States, and can only be made by incurring a debt or imposing burthensome taxes. Under these circumstances, therefore, it may be safely predicted, that a majority of the representatives of the States and of the people in Congress, will hesitate long before they consent to withdraw from the States the moneys thus distributed; but on the contrary, that they will prefer (in case it should be found necessary) to replenish the treasury by temporary loans in anticipation of the revenue.

The committee, therefore, wholly dissent from the opinion expressed by the joint committee of

the last Legislature, upon the subject of this deposite fund, that the pecuniary means which it has furnished to the State, should be regarded as merely "temporary," and that the period of repayment is "not far remote." On the contrary, they are well satisfied, that the sum of $3,974,520 71 thus acquired, will never be withdrawn; and they recommend, that in all measures of legislation, it should be treated as a portion of the permanent property of the State.

The amount so received, has been loaned under the law of the last session, upon mortgage, to the citizens of this State, and yields a nett annual income of about $250,000; and the question then arises—How shall that income be appropriated?

It may be used in either of three modes. First, in defraying the ordinary expenses of supporting the government; or, secondly, in paying the interest on debts created, or to be created, for works of internal improvement; or, thirdly, in providing for public instruction, and the diffusion of knowledge.

It is not the province, or the intention of the committee, to estimate the comparative merits of these important objects. The duty of providing adequately for the education of the people, and that of furnishing the means of cheap and easy intercourse between the different sections of the

State, are equally pressing and imperative. If the Legislature should be satisfied, however, that the State possesses other resources for prosecuting, with vigour and effect, all its necessary works of internal improvement, no question need arise as to the propriety of appropriating the whole of this sum, (large as it may be deemed,) to the gratifying office of diffusing more widely the blessings of education. But before such an appropriation shall be permanently made, it ought to be distinctly understood, that the other means of the State are, and will continue to be, entirely sufficient to satisfy the claims of that large portion of its population, whose welfare is depending upon the proper extension of its works of internal improvement. The original intention of the State, in procuring the distribution of the surplus revenues, evidently was to apply its portion "to the extension of our public works;" and until it shall be satisfactorily ascertained, that this great duty may be otherwise adequately discharged, it may well be doubted whether these funds ought to be wholly appropriated to any other object, however meritorious.

It is believed that an attentive examination of the pecuniary resources of the State will satisfactorily demonstrate its ability to prosecute and extend its system of public works on the most liberal scale, without resorting for aid to the fund in question: and the investigation of this point has occupied the anxious attention of the committee.

This inquiry necessarily embraces not only the present, but also the future fiscal condition of the State, as its aspect may be varied from time to time by the progress of the public works. The want of a definite and well-digested system, by which to prosecute our measures of internal improvement in regular and proper succession, increases the difficulty of accurately estimating the future condition of the treasury. The movements of the State, for the last few years at least, have been irregular and disconnected, yielding only to occasional impulses, and proceeding without much plan or method. A struggle for some time has been going on between the friends of a vigorous system of internal improvements, and those who deny its expediency or safety ; and our legislation has fluctuated according to the prevalence of one or the other of these contending opinions. It is not necessary or desirable to enter at this time into the particulars of this controversy, and it is alluded to only to explain the difficulty which it occasions in predicting, with that precision which could be desired, the future movements of our fiscal system.

In order to comprehend truly the present situation of our finances, and correctly to estimate our future progress, it will be useful to revert to the condition of the treasury when the canal policy was commenced.

Our financial history, during the last twenty

years, is indeed replete with instruction. Within that eventful period we behold the origin, progress, and final success of those great measures of internal improvement, which have overcome not only the barriers of nature, but the more formidable obstacles of prejudice, incredulity, and error, and which are destined, in the latter respect at least, to achieve victories yet more signal.

No fact in all that history is more striking than the remarkable failure of our distinguished men adequately to estimate the pecuniary value of the canals. The most sanguine anticipations of the most enthusiastic supporters of our policy of internal improvement, fell far short of the actual results which that policy has produced; while the doubts and forebodings of its opponents, are remembered only as curious portions of our intellectual history. The State itself seemed wholly unconscious of its latent strength. In the present plenitude of our success, the fact is hardly credible, and yet the documents of the day testify, that before commencing the canals, the Legislature by a deliberate act, directed commissioners to solicit pecuniary donations in aid of the enterprise, not only from Connecticut and Vermont, but even from the States, then in their infancy, beyond the Alleghanies: and so far was this timid and discreditable policy pursued, that the very preamble to the law of 1817, which finally directed the canals to be commenced, took

care to express the humble hope, that the States interested in the work, "would contribute their full proportion of the expense."

The torrent of ridicule and obloquy which the canals encountered, during the first few years of their progress, as well as the more solemn doubts of some of our ablest statesmen, will long be remembered. Without adverting to names less distinguished, it needs but to state the memorable fact that Mr. Jefferson pronounced the undertaking utterly visionary and chimerical, and that it was "at least a century in advance of the age." Nor did the more decided friends of the canals appreciate in any just degree, their pecuniary value. In the year 1821, four years after they had been commenced, the Comptroller of the State, in obedience to a resolution of the Legislature, prepared an estimate of their respective revenues, in which he stated, that for the ten years next succeeding their completion, the tolls would amount annually to one hundred and fifty thousand dollars! The amount which was actually received during that period of ten years, exceeded ten millions of dollars. Among the names truly illustrious in the early history of our public works, few are more distinguished than that of Gouverneur Morris. His comprehensive intellect and ardent temperament enabled him to look far beyond most of his contemporaries into the rapidly expanding future; and yet even he fell short of the realities which the Erie canal has

brought within our view. In the singularly eloquent and animated memorial by which his fame is forever connected with that great work, and in which he endeavoured to enforce upon the Legislature the importance in all future time of connecting the Hudson with the western waters, after depicting the wide spread region around our inland seas, and its capacity to supply the means of a great and profitable commerce, he asked whether it would be deemed extravagant to predict that the canal, within twenty years, "would annually bring down 250,000 tons?" The actual amount which reached the tide in 1836, was 697,347 tons, or nearly three-fold the quantity estimated by Mr. Morris; and the total tonnage of that year, ascending and descending, exceeded thirteen hundred thousand tons.

The tolls of the canals in 1824, one year before their completion, were $340,000. In the next year they reached $566,000, and rose in 1826 to $762,000. With the rapid progress thus strikingly exhibited, few of our citizens were inclined to believe that the canals had impoverished the treasury, or that they would prove in any way injurious to the pecuniary interests of the State. The subject was, however, presented to the public in the year 1827 in a new and unexpected light. In that year, the canal committee of the Senate, of which Mr. Silas Wright, jr., was chairman, introduced into that body a report, made avowedly for the purpose

of drawing the attention of the public to the effect which the construction of the canals had produced upon the finances of the State, and of generally diffusing among our citizens a knowledge of the real situation of the public funds. It announced that "*an alarming change* had taken place in the public funds"—that the school fund was annually "charging the State with a debt of $15,000"—that the literature fund was "no longer able to answer the calls which the interests of education required should be made upon it"—that the actual income of the canals was "highly exaggerated in the public opinion"—that their gross receipts for the year 1826, without any deduction for expenses, were but $752,000, and paid an interest of only 6 $\frac{9}{16}$ per cent. on their total cost—that the debt of the State for the canals then made or making "would more probably be enlarged than lessened at the end of the year"—that "so long as it thus continued to increase, its final payment *was not even approaching*"—that "unless assisted by auxiliary funds, the canals would not pay their own interest and expenses, and redeem their debt within any reasonable time, *if they would ever do it*"—that "the debt, with the whole aid of those funds, could not be paid off in *a great number of years* yet to come"—and finally, that any appropriations by the State for the purpose of constructing other works, unless they should be more productive than the Erie and Champlain canals, would "hasten the period when direct taxation must be resorted to."

The feeling of despondency which this celebrated document produced among the friends of internal improvement, not only in this State, but throughout the Union, is well recollected: and yet it is somewhat surprising, that an intelligent and sagacious people, should have permitted themsolves for a moment to be misled by the financial view which the report professed to take. Its fallacy was obvious—consisting in the total omission to take into the account, the prospective, but certain and inevitable increase in the growth of the country, and the trade of the canals, and in assuming the receipts of 1826 as an immutable basis. It is needless to add, that the friends of internal improvement made a resolute, though ineffectual struggle against the doctrines and tendencies of this report. The late Governor Clinton, on the assembling of the Legislature in the year 1828, labored earnestly in his annual message to disabuse the public mind. He declared that "the real condition of the finances had been greatly discoloured and misunderstood by inaccurate views and partial examinations"—that "fallacious statements had been mingled with the subject"—that "the constant and progressive increase of the canal revenue, and the correspondent diminution of the debt, would in a few years produce its total extinguishment"—that "the elaborate and systematic attempts to depreciate the utility and arrest the progress of internal improvements, were equally astonishing and mortifying"—that "the means

of the State were ample, her resources great, and her credit equal to any emergency," and he renewed, "in the most earnest manner, his recommendations in favour of the leading objects which he had presented in his former communications."

The death of this great man in February of that year, withdrew from the cause of internal improvement its ablest champion, and the loss has been severely felt by the people of this State.

The predictions of his last message as to the progressive increase of the tolls, and the extinguishment of the debt, have been fully realized. The annual tolls, which in 1826 were $762,167, (or according to the statement of Mr. Wright about $752,000,) amounted, in 1833, to $1,542,695, although the rates had previously been reduced nearly 20 per cent.; and in the year 1835, to $1,485,775, although again reduced about 15 per cent.

On the 1st day of July, 1836, the tolls had accumulated in the hands of the commissioners to an amount sufficient (with the aid of the auxiliary funds previously realized from the salt and auction duties) to extinguish the whole of the outstanding debt. Previously to that time, upwards of four millions of dollars had been paid in cash directly to the public creditors; and the residue, amounting to between three and four millions, was then invested

in temporary loans by the Commissioners, as trustees for the holders of the balance of the debt.

This final consummation may justly be regarded as the crowning event in the canal policy of the State, and fixes an important epoch in its fiscal history. It affords, moreover, an opportunity peculiarly fitting, not only to review the progress of our treasury since the commencement of our canals, but also to examine how far the view of the finances taken by the committee of the Senate, in the report of 1827, has been borne out by the facts.

In the year 1817, when the canals were commenced, the funds of this State consisted of,

1. Productive property in bank stocks, mortgages and other claims, amounting to, . . .		$4,779,302 70
The State then owed a debt of		1,503,685 00
Leaving a balance of		$3,275,617 70
Of these claims a portion was subsequently discovered to be worthless to the amount of .		302,000 00
Leaving, ...		$2,973,617 70
The annual income of this balance was about	$180,000 00	
The State derived a revenue from auction duties of	191,123 38	
and from salt duties imposed in that year, and paying in 1818,	48,784 27	
Making the total revenue .	$419,907 65	

2. Unproductive property in lands and public buildings; the former containing about a million of acres. From the sales of these lands a fund had been previously established for public instruction, called the "Common School Fund," the principal of which, on the 1st January, 1817, amounted to	$982,242 26
The Constitution of 1821, transferred to this fund all the lands then remaining unsold, with some unimportant exceptions.	
Another special fund had also been established principally for the support of academies, called the "Literature Fund," the principal of which, on the 1st of January, 1817, amounted to .	$26,696 10
By an act passed in 1826, the amount of $233,616 19 was taken from the $2,973,617 70 above mentioned, and transferred to the Common School and Literature Funds, leaving . . .	$2,740,001 51

To contradistinguish this amount of $2,740,001 51 from the two special funds above mentioned, it was designated in the public accounts as the "General Fund."

When the canals were commenced in 1817, another special fund was created for the security of the public creditors of whom money should be borrowed for the construction of the canals, designated as the "Canal Fund," and consisting of the salt and auction duties above mentioned, the tolls to be received from the canals when constructed, and some other items of minor amount.

The establishment of this latter fund conse-

quently diverted from the ordinary uses of the treasury, the salt and auction duties, amounting to $239,907, and reduced the nett income of the State from $419,907 65, as above stated, to about $180,000 annually.

A tax had previously been laid on the whole property of the State, to defray the expenses of the war, which had recently terminated. That tax was continued at a reduced rate, until the year 1826, and was applied, together with the annual income of $180,000 above mentioned, to the payment of the ordinary expenses of the government.

In 1826, the rapid increase in the canal tolls began to exhibit itself as is above stated, and the State tax was then discontinued, upon the ground that the principal of the remaining balance of $2,740,001 51, would sustain the government until the debt for which the salt and auction duties and canal tolls were pledged should be extinguished, and that those revenues would then be liberated and placed at the service of the State.

Between that time and the year 1836, the whole of that balance was accordingly expended, principally in defraying the ordinary expenses of the government, amounting to . . $2,740,001 51
and the State also borrowed the
bank safety fund, amounting to . . 416,532 43

Making in all, ... $3,156,533 94

Of this amount, a portion exceeding $500,000 was expended in erecting the State Hall and the State Prisons.

The aggregate amount of the salt and auction duties which were received, between the years 1817 and 1836, by the Commissioners of the Canal Fund, and paid over to the public creditors, and which, if they had not been so applied, would have been used during that time for the ordinary purposes of the government, exceeds $5,000,000; so that although the above sum of $3,156,533 94 was thus expended, the salt and auction duties remain to the amount of the $5,000,000 virtually invested in the canals, and stand as a substitute for the $3,156,533 94.

In the year 1832, in order to extinguish a claim of John Jacob Astor to lands in Putnam county, sold by the State, and the title to which had proved defective, a debt was created called the Astor Stock, to the amount of $561,000.

Since the year 1825, the State has also created debts in constructing lateral canals, which remain outstanding, viz:

For the Oswego canal,	$421,304
Cayuga and Seneca,	237,000
Chemung,	316,000
Crooked Lake,	120,000
Chenango,	2,270,000
	3,364,304

And it has commenced the construction of the Black River canal and the Genesee Valley canal, and created debts on those accounts, for	190,920
Making the total existing debt for lateral canals,	$3,555,224

Between the years 1817 and 1837, the Common School Fund was increased from $982,242 26 to $1,916,647 68, and the Literature Fund from $26,696 10 to $268,092 87.

On the first of January, 1837, the productive property of the State consisted of the canals :— which produced a nett revenue in the year 1836, (after deducting all expenses of collection, and of maintenance and repairs,) of $1,107,871 30; equivalent to an annual income at 5 per cent. on a principal of $22,157,742

The debts of the State now are :

To the Bank Fund, ...	$416,532	
The Astor debt, ...	561,000	
For the lateral canals, ...	3,555,224	
		$4,532,756
Which, deducted from the productive property as above, leaves a balance of		$17,624,986

The income of the State may then be estimated as follows :

Nett revenue from the canals as above, . .	$1,107,871 30
The revenue of 1836 is assumed in this estimate, for the reason that the tolls of 1837 were reduced by accidental and temporary causes.	
The auction duties, which produced in 1837, .	214,458 62
The salt duties, do. .	111,516 89
Total, ...	$1,413,846 81
From which deduct interest on the debt of $4,532,756 65, ...	$226,662 83
There remains, ...	$1,187,183 98
The ordinary expenses of the government are estimated at	400,000 00
Leaving a clear annual surplus revenue of	$787,183 98

It thus appears that in the twenty years from 1817 to 1837, the productive property of the State was increased from $2,973,617 to $22,157,742, (or after deducting the debt, $17,624,986); the annual revenue, from $419,907 to $1,413,846; that during the same period, $500,000 was expended upon the public buildings; that the school and literature funds were doubled; the State tax discontinued, and the people relieved from burthen or expense in supporting the government.

It would naturally be supposed, that the signal success which has attended the prosecution of our canal policy, would have removed all opposition to the extension of a system which has produced such prosperous and profitable results: and

yet there are still to be found within this State, individuals of respectability and influence who zealously maintain that the treasury has been impoverished and exhausted by our public works: that the extension of the system will impose grievous and everlasting burthens upon the people:—and that "internal improvement," (in the often repeated phrase of a distinguished advocate of these opinions,) "is but another name for eternal taxation." Upon what ground this strange doctrine rests, is really not easy to discover. The State, within the last twenty years, has quadrupled its productive property; relieved its citizens from taxation, and now enjoys a clear annual revenue of nearly eight hundred thousand dollars; and how, under these circumstances, its treasury can be regarded as impoverished or exhausted, is wholly beyond the comprehension of the committee. The supporters of this doctrine, however, allege that the "General Fund" is squandered, and gone;—that the State has no other fund to which it can legally resort;—and, therefore, that the treasury is exhausted, and taxation has become necessary. But neither of these propositions is founded in fact. The General Fund is neither squandered nor gone, but now exists in full vigour, invested in the canals, and in that shape yields an ample revenue to the treasury; and it is no more lost than the seed is lost, which, when sown, produces an abundant harvest. The treasury, in fact, is overflowing with the tolls derived from the canals;

and to those tolls the state may now legally and properly resort, for the purpose, not only of meeting all its present obligations, but of extending the benefits of internal improvement to those hitherto neglected portions of its population, at whose common risk, and upon whose common credit, the canals were constructed.

But it has been contended that these revenues are placed "wholly beyond the reach" of the representatives of the people: and upon the ground that the 10th clause of the seventh section of the Constitution of 1821, has declared that the tolls shall not be "reduced or diverted" at any time before the "full and complete payment" of the moneys borrowed for the construction of the Erie and Champlain canals: and it is averred, that in point of fact, those moneys have not been fully and completely paid, according to the literal requirements of that clause.

This objection, it will be perceived, if well founded, will apply equally to the reduction, as to the diversion of the tolls and as it involves in both respects important consequences, it deserves attention.

The Convention which framed the amended constitution assembled in the year 1821, and only a few months after the comptroller had estimated that the tolls of the canals for the ten years next

after their completion would be only one hundred and fifty thousand dollars annually. From peculiar causes, not necessary now to state, a large majority of that body participated in the doubts and forebodings as to the eventual success of the canals, which then prevailed with a considerable party throughout the State; and there is good reason to believe that many of its leading members honestly feared, that the debt to be incurred in constructing those works would never be paid; and that if the tolls should be reduced or diverted, a perpetual tax to pay the interest would be imposed upon the people. It was mainly under the influence of this apprehension, and far less, if at all, for the purpose of affording a specific pledge to the public creditor, that the clause in question was inserted in the constitution.

The total amount borrowed to construct the canals, was $7,672,782, of which amount $5,326,-295 has since been paid directly to the public creditors, and certificates of stock have been cancelled to that extent. The duty of receiving the money and holding it for the creditors, is by law entrusted to the board of Commissioners of the canal fund; and that body stands between the State and its creditors, acting at the same time as agents of the State and trustees for the creditors. The Commissioners have discharged their duty so far as to receive from the State "full and complete payment" of the debt; and they are now engaged

in executing the remainder of their trust, by paying the money to the creditors. They have repeatedly notified those creditors by public advertisements, both in this country and in Europe, and also by written circulars whenever their residence could be discovered, that they had received the money, and were prepared to pay it ; but as the debt, according to the terms of the loan, does not fall due until 1845, the Commissioners, in order to avoid the responsibility incurred in keeping so large an amount permanently invested, have offered large premiums to the creditors to come forward and receive payment and surrender their certificates. The Commissioners have thus reduced the amount to $2,346,487 ; so that little more than two-sevenths of the original sum now remains unpaid. As a considerable portion of this remnant of the debt is held by persons residing in foreign countries, it is not improbable that some of them may neglect or refuse to receive payment until the year 1845, and the money must consequently remain at least until that time invested for their benefit in the hands of the Commissioners. It will be perceived, that whatever force there may be in this constitutional objection, will not be diminished by the payment of any portion of the debt, however large ; so that whether five-sevenths or ninety-nine-hundredths of the debt should be paid, the position would not be varied. The pledge can only be literally performed by paying the last remaining dollar to the last remaining creditor. No middle ground exists between this extreme consequence and the position that the

pledge is satisfied for all fair and practical purposes, when the amount of the debt is paid over to the Commissioners and safely invested by them in trust for the creditors.

It is under these circumstances that the doctrine is advanced, not on the part of the holders of this remnant of the debt, (for it is believed that they are wholly indifferent as to the matter,) but by those who seek to arrest the progress of our public works, that the canal tolls shall not be reduced or diverted until the last dollar shall be literally paid to the creditor. That no matter how important it may become to our commerce and general interests to revise and regulate the rates of toll; that no matter how just or pressing may be the claims of other parts of the State for works of internal improvement; the canal tolls shall be held "beyond the reach of the Legislature;" at least until the year 1845, when interest ceasing on the debt, the creditor may probably be willing to receive payment:—and the doctrine involves this monstrous consequence, that the whole accumulating amount of the tolls, which with the compounding interest, would produce, by the year 1845, at least ten million of dollars, must be kept invested in money as a further pledge for the payment of a sum of two millions, and which very two millions already exists in money invested on safe security; and that in the mean time the public improvements of the State must be deferred, and direct taxes

imposed to defray the ordinary expenses of the government!

In the judgment of the committee no such absurdity was contemplated by the framers of the Constitution, or could ever be submitted to by the people. The clause in question evidently was intended merely as a guaranty, not so much to the public creditors as to the people of the State at large, that a sum should be raised from the tolls and other revenues pledged, sufficient to satisfy the debt, and provide against the hazard of taxation for that purpose. And this was all its object. It was never dreamed that ten millions should be accumulated in order to pay two millions. The restriction was adopted upon the mistaken calculation that the revenue would not more than pay the debt as fast as it became due. Time has disclosed that error. The money is raised and ready, and upon every sound and rational principle of construction the pledge is satisfied. The State has done all that the most scrupulous good faith could require, and no reason exists why the tolls which are thus redeemed and unfettered, should not be regulated or reduced in such manner as the Legislature shall think fit, or applied to any beneficial purpose which the public interests may require.

And in this light the question has been viewed by the representatives of the people. By the act

of May 11, 1835, the Legislature directed that the canal tolls should be expended in enlarging the Erie Canal to such dimensions as the Canal Board should determine, who were thereby also authorized to construct an "independent canal," in such parts of the route as they thould think expedient. The canal, according to the plan since adopted by the Board, will be about three times as large in volume as the existing canal, and its location will be changed for several miles of the route. The Revised Statutes, in 1830, had explicitly declared the Erie and Champlain canals to be completed: so that both legally and practically, the canal thus altered in dimensions and in location, may be considered as a new work. The tolls expended in its enlargement, to all technical intents, are as much "diverted," as if employed in constructing a lateral canal or any other of the public works of the State; and the consequences, so far as the public creditors or the people of the State at large are concerned, are in no respect different.

But the 9th section of the act placed the intention of the Legislature beyond all doubt: for it directed that the expenditures in thus enlarging the canal "should be so limited as to leave from the canal revenues an annual income to the State of at least $300,000." In other words, the Legislature appropriated that amount of the canal tolls to the ordinary uses of the government.

By a subsequent act, passed May 16, 1836,

the Legislature increased this annual sum from $300,000 to $400,000: but possibly for the purpose of quieting constitutional scruples, the phraseology of that law directed the Commissioners of the Canal Fund to "loan" that sum annually "to the treasury of this State, for the use and benefit of the General Fund;" and the Comptroller was directed to charge the General Fund "as a debtor," for such loan to the Canal Fund. It is rather to be regretted that it should have been thought proper or necessary to throw the transaction into this form. If the State owned the tolls free from the encumbrance of the public creditor, no necessity existed for this legislative fiction. If it did not, the propriety of abstracting the tolls, under the guise of a loan to the General Fund, (which fund existed only in the canals themselves) may well be questioned: while the very fact of charging the State, or the General Fund, "as a debtor," for the amount of the tolls, was calculated needlessly to perplex the public mind in regard to the true state of the finances.

It is therefore quite evident that the tolls of the canals have been brought fully within the reach of the Legislature: and the very important question then arises, in what mode shall they be appropriated so as most effectually to promote the progress of the public works?

By the acts of 1835 and 1836, the tolls, after

deducting $400,000 annually, (and of which sum about one half is applied in paying the interest on the debt for lateral canals,) have been appropriated to the enlargement of the Erie canal. The cost of that enterprise, originally estimated at $12,000,000, will not probably fall short of $15,000,000: so that if only the nett revenues (now amounting as it is above shown, to $787,183,) shall be applied to that purpose, the work cannot be completed short of twenty years: and during the whole of that time those other works must be deferred, which could be aided by this revenue in case a proper scheme of finance were to be adopted.

The policy and the plan of enlarging the canal, have been definitely settled by the constituted authorities, and after mature consideration. Expenditures have already been incurred in prosecuting the work to an amount exceeding $600,000, and contracts have been made in addition to the extent of nearly three millions. The idea of abandoning the undertaking, even if it were desirable, is therefore quite out of the question. The committee are moreover satisfied, that the speedy enlargement of the canal is required by the best interests, not only of the inhabitants in its immediate vicinity, but of the people of every part of the State. The Canal Commissioners in their recent report to the Legislature, have estimated its annual tolls within a few years after it shall be completed, at no less than

three millions of dollars, equivalent to an annual income of five per cent. on a capital of sixty millions, and that of this large revenue at least one half will be paid upon property passing to and from other States. It is quite evident that such an income will enable the State, after making the most judicious revision of the rates of toll, to extend its fostering aid to every portion of its territory, however remote or sequestered. To secure such a result with the least practicable delay, is therefore an object of general importance.

The canal, when enlarged, will be greatly increased in value and power, and in point of magnitude will be one of the most important works, not only of this country, but of the age. Its capacity exceeding that of the present canal, at least seven fold—being seven feet deep and seventy feet wide, with double locks of enlarged dimensions throughout the whole line,—it will furnish the means of convenient transit for not less than ten millions of tons annually. The supply of water will be abundant and unfailing, and the enlarged size of the boats by which it will be navigated, will reduce the cost of transportation nearly one half; so that if the tolls should even be retained at their present rates, the saving to the community in the aggregate expense of conveyance, would be from one-fourth to one-third of the amount now paid. It must be borne in mind however, that to effect this saving, the enlargement must be completed

throughout the whole line, so as to avoid the expense and delay of trans-shipment,—and from this fact it will be obvious, that important financial consequences are involved in its speedy prosecution. By proper efforts the enlargement may be completed and made available within five years. At the expiration of that period, the interest, at five per cent., compounded half-yearly, on the cost of the work, (estimating it at fifteen millions,) will amount to about two millions and a half of dollars; whereas, if the completion shall be delayed twenty years, the intervening interest alone will exceed nine millions; showing a loss of interest by proceeding at the present sluggish rate, of at least six and a half millions of dollars; a sum which of itself would go far to extend the benefits of internal improvement to every other section of the State.

In order thus to expedite the work, it will become necessary to borrow money and incur a temporary debt. That this suggestion will alarm those who regard a public debt as the greatest of all public calamities, is not improbable; and it may very possibly arouse opposition, as violent as that which was arrayed against our canals in their early stages. The hope is however indulged, that the successful example furnished by that great experiment will dispel any groundless fears, and impart to our public councils that degree of moral courage which the occasion requires.

Our fathers did not hesitate to encounter debt, even when the means of paying the interest were unascertained and contingent; and surely we may venture upon a similar effort, now that we are certain that the revenues of the State will suffice to pay the interest. The present nett annual revenue of the State, after paying its expenses and the interest on its debt, is $787,183, as above stated. That sum alone will pay the annual interest, at five per cent. on $15,743,660; and that amount may therefore be borrowed and expended, and the interest punctually met without taxation. Any augmentation which shall be experienced (either by means of the expenditure of that sum, or from any other cause) in the revenue of the canals, will itself increase to a corresponding extent the ability of the State further to borrow and pay the interest. It is evident that every $500,000 of revenue will serve as a basis of finance to sustain ten millions of debt. If the estimate of the Canal Commissioners is correct, (and from their well known caution their opinions in this respect are peculiarly entitled to confidence,) that the enlarged Erie Canal will yield an annual revenue of three millions, equivalent to five per cent. on sixty millions, it will at once be obvious that a sum of thirty millions may not only be borrowed, and expended, but wholly reimbursed, within twenty years; or that forty millions may be so borrowed, expended, and reimbursed, in twenty-eight years.

Nor need it be apprehended, that in order to produce these immense results, the tolls of the canals must be maintained at oppressive or injurious rates. During the years 1833, 1834 and 1835, the rates were reduced in the aggregate about 35 per cent., and yet during these three years the tolls amounted to $4,209,000; whereas in the three years next preceding the reduction they had amounted to only $3,185,000, exhibiting an increase of upwards of a million of dollars. The responsible duty of regulating the tolls to be imposed upon the great and almost illimitable trade which our canals are to enjoy, and of fixing the rates so judiciously as best to promote our commercial and agricultural prosperity, and at the same time adequately to strengthen our fiscal resources, will undoubtedly be exercised with that prudence, liberality, and forecast, which the magnitude of the subject demands. Whatever rates of revenue may be eventually adopted, we may safely assume that the State will take care to reserve such an amount in the aggregate as the interests of its treasury and the general welfare of its citizens shall require.

The committee, therefore, have no hesitation in recommending that the State proceed promptly to borrow such moneys as are needed to prosecute most vigorously its public works; and in lieu of appropriating the revenue only of the present canals for the purpose of making such expenditures as the general interests require, they would

suggest that the State should retain that revenue as a sinking fund to pay the interest on all moneys it may borrow, from time to time, to prosecute and perfect a liberal system of internal improvement.

It is not the appropriate duty of the present committee to point out those particular works which stand most in need of the efforts or the fostering care of the State. That gratifying office will devolve upon those by whom it will doubtless be faithfully and wisely discharged. The view which they have sought to take, is purely fiscal in its nature: aiming only to demonstrate the pecuniary ability of the State to proceed promptly and liberally in the great work of improving its internal condition and developing its resources. They confidently believe, that the success hitherto attained in the prosecution of our system of internal improvement is but the precursor of triumphs far more important; that the results we now enjoy but faintly shadow forth the vast realities which are within our reach; and that it needs but to employ promptly and vigorously our resources to augment yet more fully and gloriously the power and prosperity of the State. Without trespassing upon the province of those whose duty it is to prescribe the particular details of those great measures of policy, by which our dormant energies may thus be roused into salutary and profitable action, the committee would observe generally, that the works which for

the next few years will occupy the attention of our public authorities, are,

1. The rail-roads connecting the distant extremities of the State, and the interior portions with each other.

2. The Erie canal with its various tributaries.

On the subject of the policy to be pursued by the State in regard to the construction of rail-roads, differences of opinion exist.

On the one hand it is contended, that these great avenues of travel and communication which affect so intimately the convenience and welfare of all our people, should be constructed and managed exclusively by public agents acting under public authority; and the success of those governments which have pursued that policy, not only in cheapening the cost of transport, but in avoiding the mischiefs of monopoly has been adduced as a reason why the State should possess, and at all times regulate, this important branch of our internal improvements.

On the other hand it has been urged, that the employment of the great number of persons required to conduct the manifold details of these crowded channels of transportation, would throw into the hands of the State, an undue amount of

power and patronage: and it is alleged that this danger will be avoided, and the public convenience in other respects promoted, by entrusting their management to companies of individuals duly incorporated. It is also contended, and especially by those who are habitually sceptical as to the success of our public works, that the value of rail-roads has not yet been sufficiently tested, and that they will eventually fail to yield results sufficiently profitable to render it desirable for the State to construct them at the public expense.

The State has declined, hitherto, to construct rail-roads on its own account, but has preferred to commit that duty to incorporated companies; and has afforded aid, at least, in one important instance, by a loan of the public credit, taking as security a mortgage of the work. If a similar course shall be pursued in respect to all the rail-roads which may stand in need of public assistance, and the interest on the stock to be thus loaned shall be regularly met by the companies, the treasury will remain wholly unaffected by such measures of aid, and in a fiscal point of view, the State will experience neither profit nor loss.

The Legislature has taken care, however, in the charters by which the rail-road companies have been incorporated, to reserve the right ultimately to take those works for public use, and the State may possibly exercise this right at some future

period. The total cost of the leading lines will not fall short of eighteen or twenty millions of dollars; but the State will find no difficulty, whenever it may see fit to take these works, in making such financial arrangements as the occasion may demand.

The sum which the treasury will require for the canals now in progress, will be:

1. For enlarging the Erie canal, including damages, ...	$15,000,000
2. For the Genessee Valley and the Black River canals, (authorized to be constructed by laws passed in 1836,) in addition to the amount of $190,920 22, herein-before included as part of the State debt, not less than	5,000,000
	$20,000,000

For the two last mentioned canals, loans have been already negotiated to the amount of $2,800,000, but the proceeds, (with the exception of the $190,920,) have not yet been expended.

In addition to the amount above stated, it may be observed that sundry projects for other canals of smaller extent, have been more or less enter-

tained, including among others, an extension recommended in the Governor's message in 1836, of the Erie canal from Buffalo westward to a point on Lake Erie less obstructed by ice: the extension of the Black River canal into the mineral districts of St. Lawrence county: the continuation of the Erie canal, or the construction of a branch from it to some proper point below the Overslaugh: and some other extensions of existing works. If any considerable portion of these projects should be carried into execution, the cost will not probably fall short of $5,000,000.

The connexion which it is proposed to effect by means of a ship canal between Lake Erie and Lake Ontario, has been excluded from the above estimate, under the belief, that a work so interesting and important in a military point of view, will be constructed at the expense and under the authority of the general government.

It thus appears:

1. That the amount which the State must expend under existing laws, for the enlargement and construction of canals already commenced, will be $20,000,000
2. That the amount to be paid from time to time, for taking rail-roads for public use, whenever the State shall find it beneficial to the public interests to do so, may be from

ten to twenty millions, according to the extent of the works to be selected: or say	$15,000,000
3. That the amount to be hereafter authorized for extensions of the present canals, may be . . .	$5,000,000
Making a total of	$40,000,000

It is not, however, to be inferred that the committee intend by stating the above sums to recommend an expenditure to the amount of forty millions upon our public works. It is certain that, under existing laws, at least one half of that sum must be so expended; but whether any portion of the residue will be appropriated, will of course depend upon the views of the present and succeeding Legislatures. They wish merely to be understood, that if the Legislature from time to time shall see fit to expend that sum, it may be safely borrowed, without imposing any burthens upon the people; and that if the views of the Canal Commissioners, as to the future revenues of the canal, are correct, the whole amount, within thirty years, may be reimbursed, and added to the productive property of the State. It is not improbable, that those who are in the habit of decrying our public works, may assert that a debt is to be incurred to an alarming amount, to be handed down as a grievous burthen to all future generations: and yet, in truth, we shall

only hand down what our fathers have transmitted to us, public works, paid for and free from debt, and themselves affording the means of still further augmenting the power and wealth of those who are to follow us.

Nor will this event be deemed at all improbable, when we reflect that within the last twenty years the canals have come down to us free from debt, and worth more than twenty millions. Actual experience has thus familiarized us with the certain operation of an excess of revenue in extinguishing a debt created for public works,—but for the sake of presenting the suject in a more perspicuous form, an arithmetical table is subjoined,—exhibiting the progress of a debt within the next ten years, to the extent of forty millions; and then the successive stages by which it will reach its final extinguishment.

In respect to that part of the annual report of the Comptroller of this State on the finances referred to the consideration of the committee, which suggests the expediency of levying a tax for the purposes of the treasury, they are compelled to state that, in their judgment, no necessity exists for that measure. They are aware that, from the year 1827, when the report of Mr. Wright announced to the public that internal improvements could only be sustained by direct taxation, down to the present time, our fiscal officers have habitu-

ally urged upon the Legislature the necessity of resorting to that method of levying money for the use of the State. It is not without diffidence, that the committee feel themselves compelled wholly to dissent from the experienced individuals who, for the last ten years, have controlled our public affairs; but, after a laborious and careful investigation, they have been unable to discover any reason why such a mode of raising money should have been recommended. In the opinion of the committee there is no possible ground upon which a tax could be justified. The treasury is full and needs no replenishing: and ample means are provided for meeting the future engagements of the State. Under such circumstances, to subject the people to the burden of a direct tax, would be equally unwise and unnecessary.

It is stated, however, by the Comptroller, and the fact has been repeatedly urged in other official communications, that Mr. Jefferson lays down the rule that a government disposed to cherish its credit "should never borrow a dollar without laying a tax in the same instant for paying the interest annually, and the principal in a given time." But the maxim is not sound, to the extent to which it is thus attempted to be applied. It will be recollected that Mr. Jefferson lived in a period of war and wasteful expenditure; and in speaking of the consequences of public debt, he doubtless intended to refer to expenditures upon objects not of them-

selves yielding a pecuniary return—such as the public defence, the protection of commerce, or the expenses of the civil administration. No reason can possibly exist for extending the rule to debts incurred for public works, themselves producing an income equivalent to the interest; nor is it absolutely requisite, that such revenue shall be received "in the same instant" in which the debt is created, provided that it will be realized within a reasonably moderate period. It may, indeed, be admitted, that when such result is problematical, or only to be realized at a remote period, the tax ought to be laid when the work is commenced; provided always that the government possesses no other pecuniary means of paying the interest. But then it must be shown that no such auxiliary resources are possessed, for otherwise there could be no necessity for levying money by tax for the mere purpose of preserving pecuniary funds which could be more directly and economically applied to the object in question. And this is the view which the Legislature has taken of this question, from the year 1826, when the State tax was discontinued, down to the present moment. Although annually urged to levy a tax, they have annually refused: but have seen fit to rely on the revenues from the public works, to meet the demands on the treasury. The result has shown that they were right; for although the State since 1825, has expended in constructing lateral canals the sum of $3,364,304, it has still remaining an

annual surplus revenue of nearly $800,000; and its people are free from taxation.

Without pretending, therefore, to detract from the general authority of the maxim thus quoted, it may be claimed that our own experience has shown it to be inaccurate, when applied to debts created for works of internal improvement. In truth, it is hardly credible that Mr. Jefferson ever intended thus to apply it; but if he did, it only shows, what his incredulity in respect to the Erie canal had sufficiently testified, that enterprises of that character had not occupied his most deliberate attention.

It will be perceived that the very foundation upon which the financial calculations of the committee are based, is the estimate of the Canal Commissioners submitted to the Legislature, in which they state that the Erie canal, within a few years after its enlargement, will produce an annual revenue of $3,000,000. The importance of verifying the accuracy of this estimate will be evident, as any material error would lead to the most injurious consequences. The inquiry has necessarily embraced details of unusual magnitude, but having subjected them to a careful scrutiny, the committee state succinctly, the reasons why, in their opinion, that estimate is entitled to reliance.

The steady progress of population and wealth of

that portion of our own State which is tributary to the canal, needs little remark. Whether owing to the growth of the country on its immediate borders—or to the influence of the lateral canals, in swelling its commerce,—the tables of tonnage exhibit a rate of increase which will probably be maintained for many years. Although the contribution thus furnished by the State to the revenues of the canal, at the present time is large, (for two-thirds of the whole of its tolls are now drawn from the trade of our own people,) yet the amount becomes relatively unimportant, when compared with the enormous results we are hereafter to derive from our commerce with the west. Let us then advert briefly to the present extent and future progress of that commerce, and the probable effect which it is hereafter to produce upon our fiscal affairs.

The western termination of the Erie canal looks out upon Lake Erie, the most southerly and central of the great chain of navigable lakes, which stretches far into the interior from our western boundary. Around these inland seas, a cluster of five powerful States is rapidly rising. The territory which they comprise, and which is to become tributary to the canal, embraces that great area, extending from the lakes on the north to the Ohio on the south, and from the western confines of this State to the upper Mississippi, and containing 280,000 square miles. To measure its extent by well-known ob-

jects, it is fifteen times as large as that part of the State of New York, west of the county of Oneida—nearly twice as large as the kingdom of France—and about six times as extensive as the whole of England, It contains 180 millions of acres of arable land, a large portion of which is of surpassing fertility.

The productive power of this region, and its capability of supplying tonnage for export, are greatly strengthened by the facilities which it enjoys for cheap and easy transportation. In this respect, no country on the face of the globe enjoys greater natural advantages; for it is nearly encircled by navigable waters; and its broad area is intersected in numerous directions by streams furnishing ample means of conveyance, while unusual facilities for the construction of canals, and other artificial channels of communication, are afforded by the level and uniform character of its surface.

These being its geographical advantages, it needs only the requisite number of inhabitants, to fully develope its agricultural resources. Its progress in this respect has been truly surprising. In 1816, Ohio was the only organized State government within its limits. In that year, Indiana, having obtained the requisite number of 60,000 inhabitants, entered the Union, and took its place by the side of Ohio. Illinois and Michigan were then distant and feeble territories, with a few set-

tlers thinly scattered over their broad surface, while Wisconsin, unknown even by name, was an undistinguished portion of the great North-Western territory. In the brief period of twenty-one years, such has been the influx of population into this great district, that Ohio, the eldest member in this brotherhood of nations, now numbers 1,400,000 inhabitants; Indiana upwards of 600,000; Illinois and Michigan, (both of whom have organized their governments and come into the Union,) 700,000; while west of Lake Michigan, not only is Wisconsin rapidly rising, but even beyond the upper Mississippi, 30,000 citizens have already laid the foundation of yet another State. Such is the onward march of this population, that the amount of its annual increase alone exceeds in number the white inhabitants of ten of the States of the Union. The population already embraced within the district in question, falls little short of three millions, and if the same rate of progress shall be maintained for the twelve years next to come, by the year 1850 it will exceed six millions.

The peculiar activity and energy of these people, and their power most rapidly to develope the resources of the broad domain which they inhabit, are also worthy of consideration, in estimating the eventual extent of their trade. They probably possess a greater aggregate power of production than any other portion equally numerous of the human race. Their population is made up almost exclu-

sively of the young, the resolute, the vigorous, and the intelligent, who have gone from the more crowded communities in the eastern and middle portions of the Union, to seat themselves around this chain of waters, and there build up an empire. They have taken with them the laws, the habits, the language, and the institutions, civil and religious, of their parent States, but above all, they have carried into that vast field, an honest love of labour, and in the very act of organizing their governments, they testified their willingness to exert and rely on their own energies, by prohibiting slavery forever, throughout all their limits.

This group of inland States has two outlets for its trade to the ocean; one by the Mississippi to the Gulf of Mexico; the other through Lake Erie and the navigable communications of this State to the Atlantic. Whether it be attributable to similarity of origin, of laws, or of habits, or to ties of consanguinity, or superior salubrity of climate, this people evidently prefer the market on the Atlantic, and they are making prodigious efforts to reach it. Three great canals, (one of them longer than the Erie Canal,) embracing in their aggregate length about one thousand miles, are to connect the Ohio with Lake Erie, while another deep and capacious channel, excavated for nearly thirty miles through solid rock, unites Lake Michigan with the navigable waters of the Illinois. In addition to these broad avenues of trade, they are also constructing

lines of rail-roads, not less than 1,500 miles in extent, in order to reach with more ease and speed, the lakes, through which they seek a conveyance to the sea-board. The undaunted resolution of this energetic race of men is strikingly evinced by the fact, that the cost of the works which they have thus undertaken, (and most of which are in actual progress) will exceed forty-eight millions of dollars—a sum far exceeding all that New York, with two millions of inhabitants, and two hundred years of accumulated wealth, has ever attempted. The circumstance, moreover, is particularly important, that the public works in each of these widespread states are arranged on a harmonious plan, each having a main line supported and enriched by lateral and tributary branches, thereby bringing the industry of their whole people, into prompt and profitable action, while the systems themselves are again united on a grander scale, in a series of systems, comprising an aggregate length of more than 2,500 miles, with lake Erie as its common centre.

The various portions of this vast work are now in a train of rapid construction. Indiana alone has 6,000 men in her employ; and Ohio, Illinois, and Michigan are making correspondent efforts; so that it may be confidently predicted, that within seven years from this time, the whole inland trade of that broad region around the lakes, will crowd the entrance of the Erie canal on its way to the Atlantic.

It will at once be obvious, that the whole of the tonnage thus to be furnished by these communities, whatever may be its bulk, will pay to our treasury a transit duty for the whole length of the canal; and will therefore yield a revenue twice as large as an equal quantity of products from the districts of our own State, mid-way between the Lakes and the Hudson.

And what will be the amount of this tonnage, and by what standard shall we measure it?

If we take the area and the products, and the population of our own State as a guide, we fall far short; and even if we resort to more populous nations—if we select England or France, and compare their productive power with that of this youthful and rapidly increasing race, the parallel will not be complete; for a much smaller proportion of the inhabitants of those kingdoms is devoted to agricultural pursuits; nor is their inland commerce wholly concentrated with any single channel.

But we, fortunately, possess an adequate and appropriate standard in the Mississippi river, the great rival and competitor of the Erie canal, with which it is destined hereafter to hold divided sway over the vast trade of the west. The number of inhabitants who at present employ that stream and its tributaries, for the purpose of conveyance, is scarcely five millions, and yet the amount which

they paid during the last year for transportation on its waters, was between eight and nine millions of dollars.

The momentous question, whether the tonnage of the inland district under examination is to seek the Atlantic through the Erie Canal, or descend the Mississippi to the Gulf of Mexico, is mainly to depend upon the comparative cost of transportation. But when we consider the circuitous course of the Mississippi, the loss of time in ascending its strong current, and the greater rapidity of communication presented by the Atlantic route; when we advert moreover to the ample volume and trifling lockage of the enlarged canal; and especially when we estimate the commercial effects of the navigable passage opened by the Hudson through the Alleghany ridge; we shall perceive that when the artificial communications thus concentrating upon Lake Erie shall be put in full operation, the cost of transporting agricultural products from the interior of this district will not materially vary, whether carried to the Atlantic or the Gulf of Mexico. The inference, then, may safely be drawn, that whenever a population of five millions around these western waters shall resort to the Erie canal for the means of conveyance, they will supply it with an amount of tonnage equally great with that now transported on the Mississippi by an equal number of inhabitants.

It is estimated that the value of agricultural pro-

ducts which annually descend the Mississippi and its tributaries, has already reached $70,000,000. The value of the property transported on the canals of the State of New-York, during the year 1836, is shown by official tables to be $67,000,000. Of that amount, it may be estimated that $50,000,000 consisted of property belonging exclusively to a portion of the population of this State not exceeding a million and a half in number, being at the rate of $33 33 for each inhabitant; and that the amount which they paid for its transportation exceeded two millions of dollars. If the same scale of production and consumption shall be assumed for the population of the district in question, (and no reason is perceived why it should not be,) the six millions of inhabitants in the west who will resort to the Erie canal for the means of conveyance, will furnish tonnage, in exports and imports, of at least $200,000,000 in value. The experience of other nations will show that this amount is not over-estimated. The food alone produced in England in the year 1835, by an agricultural population of about eight millions, was valued by their political economists at $604,000,000; while that of France was ascertained by its Minister of Finance to be 5,237,000,000 of francs, or $980,000,000.

But there are peculiar reasons why the proportion of agricultural exports of this great inland population should far exceed that of other nations. The exuberance of their soil, the salubrity of their

climate, and the cheapness of their lands, (arising from the vast supply within their limits) will enable them always to furnish food to every other portion of the continent, on more advantageous terms than it can be elsewhere produced. Labor there reaps its best reward, and harvests of an hundred fold repay its exertions; and such is the superior productiveness of this region, that when the completion of its great series of public works shall bring a bushel of wheat on the plains of Indiana within a few cents in price of a bushel in New England, its production in New England must cease. The same cause will probably operate to change the culture of portions even of our own State; for the unequalled fertility of the West will always enable it to supply those products requiring richness of soil with a less amount of labour, and consequently at a cheaper rate, than they can be produced within our own borders.

The consequences then of perfecting these systems of intercommunication will inevitably be a distribution of labor, on a grand scale, throughout the whole northern part of the continent: the maritime portions engrossing the active pursuits of navigation, commerce, and manufactures, while this central group of agricultural States will become the common granary of the Union, and discharge the important duty of supplying subsistence to all the surrounding communities. Indeed they have begun even now to perform that office. The vallies of the

Miami, the Wabash, and the Illinois, are already pouring out their overflowing riches upon the cotton planting States below; and, although their power of exportation has hitherto been kept in check by their rapid increase in numbers, yet it is stated, that during the last season, exports amounting in value to 15 or 20,000,000 of dollars descended the Mississippi and its tributaries, from that part of the valley north of the Ohio, and constituting a portion of the great district in question. Nor is this descending stream of trade wholly withdrawn from our own channels of conveyance, for its proceeds find their way by a circuitous course through the canals of New York, and in that form swell the revenues of the treasury:—and the fact will strikingly illustrate the value of the Union, in binding in bonds of mutual benefit all our commercial interests, both foreign and domestic, and in animating every portion of our various industry, that the food thus exported from the inmost recesses of the West — exchanged for cotton at the mouth of the Mississippi — exported in that form to the workshops of Europe — again exchanged for their fabrics, and brought home by our shipping to the seaports of the north, — is at last returned through the Erie canal to the luxuriant vallies from which it first originated; thus revolving through the whole circle of our widespread commerce. It is only when we view the Erie canal as one of the mighty segments of that vast circle, that we can rightly estimate the importance and grandeur of its connexions.

It is necessary also to be apprized of the course of this trade, in order to explain the disparity in value which will always exist between the descending and the ascending cargoes. The amount of merchandise now sent into the Western States very far exceeds that of their products reaching the Atlantic sea-board. An additional reason exists, it is true, for this difference. The flood of emigration which has poured into that portion of the country has temporarily produced so great a disproportion between its consuming and producing classes, that they have scarcely been able to obtain an adequate supply of food even from their own exuberant soil. Population has outstripped production : so that their agricultural products, instead of seeking a market in the eastern portions of the Union, have been sent westward in large quantities into the upper lakes ; and such is the movement which animates all that region, that more than four hundred vessels, during the last year, reached the port of Chicago, at the southernmost extremity of Lake Michigan. So long as this great influx of population shall continue, the capacity of these interior States to supply tonnage for the Erie canal will be necessarily diminished, but the effect will be only to augment more enormously their eventual power of exportation ; and thus the present temporary check is but adding increased energy to those causes, which are operating with concentrated force to swell our future commerce.

The progress in population of that portion of this inland territory, immediately adjacent to the lakes, has been three times as great as its progress in the portion adjacent to the Ohio. The ratio of increase in the former, between the years 1820 and 1830, (as shown by the census,) was 130 per cent., and in the latter, only 44 per cent.; and the comparative rates since that time have not, probably, lessened. And this circumstance explains why so large a surplus should have been furnished for exportation from the section near the Ohio, in comparison with that which has hitherto found its way from the lakes into our canals. The total amount of tolls, realized by our treasury in the year 1836, from property passing to and from the country surrounding the lakes, was only $385,000, or less than one-twentieth part of the sum paid annually for transportation on the Mississippi, and its confluents. To fix the precise period when the population, now swarming into this district, will reach the point when their power of furnishing products for exportation, will fully exhibit itself, is, of course, impracticable. The same causes which operate to diminish their exports, now that their population has reached to three millions, may not be wholly removed, when its numbers shall be doubled, but it may be confidently predicted, that before that time they will be so firmly seated on their productive soil, as to be able to supply a vast surplus of food for export.

The population of the western portion of our own State still continues to increase with considerable rapidity, but it nevertheless furnishes an annual export of at least $20,000,000 in value. By the year 1845, the States of the West, surrounding the lakes, will hold the same relative position in respect to the whole of the Erie canal, which the counties of New York, west of the Seneca lake, now bear to that part of the line east of Utica. Our trade will then be measured, not by counties, but by sovereign States, themselves containing their fifty counties; and our revenues, no longer dependent on the villages and townships scattered along the borders of the canal, will be drawn from the wide-spread and populous communities, inhabiting the broad expanse between the Ohio and the Lakes.

We obtain, then, the following facts, by which to guide the present inquiry :—

That the value of the tonnage, annually transported on the canals of this State, being $67,634,-000, and the tolls paid being $1,614,000, the rate of toll is about 2 $\frac{7}{10}$ per cent. on the value of the tonnage :—

That this rate increasing according to the distance from tide water, of the place from and to which the tonnage is transported, the rate paid on the western section of the Erie canal, is proba-

bly as high as four, or even five per cent. :— (The present toll of 32 cents on a barrel of flour worth $8, passing the whole length of the canal, is 4 per cent., or 5 per cent., if valued at $6 :—)

That the rate of toll, on commodities passing to and from the States west of Buffalo, may therefore be safely assumed to be equal to at least *two* per cent. on their value; and it is believed, that the interests of the State will not require a reduction of the tolls below that rate :—

That a population, within this State, of one million and a half of inhabitants, furnished a tonnage of $50,000,000 to the canals,—and that, therefore the population of the States in question, when it shall amount to six millions, can furnish a tonnage of $200,000,000. It may, however, be allowed, that a considerable portion, and perhaps two fifths of their exports, will continue to descend the Mississippi and its tributaries, and that one fifth of their imports may ascend that stream.

We shall then have these results :

Descending cargoes, after deducting two fifths, ...	$60,000,000
Ascending cargoes, after deducting one fifth, ...	80,000,000
Total trade, . . .	**$140,000,000**

At the present rates of toll, say at four per cent., this trade would yield an annual revenue to our treasury of $5,600,000; and if reduced to two per cent., it would yield $2,800,000; and even at one per cent., (equal to 2 cents only on a bushel of wheat,) it would yield $1,400,000.

The evidence furnished by these facts has therefore satisfied the committee, that the estimate of the Canal Commissioners, that the tolls of the Erie canal when enlarged will, at the present rates, pay annually three millions of dollars, and that one-half of that sum will be received from property passing to and from other States, is, to say the least, not exaggerated.

It will be observed, that many of the views which are above taken of the future magnitude of our inland commerce, will be applicable to the two lines of rail-road which are to traverse our territory from the Hudson to Lake Erie. The immense effects which these wonder-working instruments of commerce are to produce in securing the trade of the West to the Atlantic States, and in binding the most distant portions of our country in bonds of beneficial intercourse, would furnish, upon the proper occasion, a subject of interesting and profitable inquiry. Nor need it be apprehended that they will affect injuriously our fiscal interests, —for so far from lessening the commerce of the canals, they will more probably serve to secure

and increase it, by affording the means of rapid transportation for property and persons during those winter months in which their navigation is impeded, and thereby preventing the diversion into other channels of those more bulky products which furnish to canals their most lucrative revenues.

Regarding the event as not improbable, that the State at no distant period will take these great thoroughfares of trade and travel as public property, and that they are eventually to become a portion of our system of public works, of which all the parts will mutually sustain and strengthen each other,—the growth of the West in swelling their revenues is by no means a matter of indifference to the public treasury.

The committee will not trespass upon the attention of the House, by expatiating upon the grandeur of the prospect which would open upon us, were we to look beyond the brief period, which the present view has embraced. It is for the philanthropist and statesman, to indulge those feelings of honest hope and patriotic pride, which cannot but arise, in contemplating the mighty realities which the future has in store. The duty which the present occasion has required of the committee, has been of a more practical character. They have attempted honestly, perhaps over-

zealously, to show that our own noble State is neither ruined nor bankrupt,—that its treasury is neither impoverished nor exhausted,—and that, however impeded in its progress by a narrow policy which would retard its growth, undervalue its strength, and stifle its energies, it is yet vigorous and erect, and able to move onward with a giant's powers. They have sought to show that the foundations of our prosperity are deeply laid; that our resources are manifold, and that they will prove adequate to any efforts which our government may make, to promote the prosperity, reward the industry, or stimulate the enterprise of our citizens, whether occupying the fair and fruitful plains of the west,—the forests and mines of the north,—or the sunny slopes and fertile vallies of our southern and midland districts.

They will not attempt to measure the consequences which the completion of a great and harmonious system of intercommunication, extending into the utmost recesses of the interior, and concentrating within our borders the trade of the most populous portion of the continent, will produce, in augmenting the aggregate riches of our State; in covering its surface with opulent cities; —in swelling its commercial marine;—in securing its political supremacy; and in enlarging, in all respects, its prosperity, power, and glory. Nor will they seek to compute the pecuniary results

which this vast and ever increasing stream of inland trade, flowing through our territory for all future time, will produce in augmenting the wealth of its commercial metropolis. The history of Venice, in its palmiest days, stretching her long line of islands and colonies far into the East, and controlling by her position the commerce of Asia, presents but a feeble picture of the splendour and riches which our own great mart must eventually attain.

Still less will they seek to span within their narrow arithmetic, the pecuniary value of the illimitable West. Were they to state that from an assessed value in 1798, of only 26 millions, for all the vast territory west of the mountains, stretching from the Gulf of Mexico to Lake Superior, wealth has arisen and been created within the short space of forty years to the amount of twelve hundred millions of dollars, they would have attained only the first step in that long series, by which an empire is to ascend to a height of power and dominion as yet unequalled in the history of our race.

Least of all will they attempt to compute the pecuniary consequences of these great arteries of trade, in cementing and preserving the union of these free and flourishing republics. It is not for New York, or her sons, to "calculate the value" of that sacred bond. But if we would catch a

glimpse, however imperfect, of the gigantic stake which is depending on our prudence and patriotism—if we would count the cost of ruined cities, and desolated fields,—of our lakes and rivers, obstructed by fleets and fortresses in war, and by commercial restrictions still more destructive in peace, we may contrast Europe as it is, convulsed by centuries of strife, and broken into jarring, disunited, and discordant communities, with Europe, as it would have been, had its whole population been united like ours, at the very origin of their governments, under one common law, speaking one common language, and bound by one common constitution.

Let us then go forward in the broad path of duty which is spread before us—and in riveting, as now we may, the bonds which unite the mighty members of this glorious Union, discharge those high and solemn obligations which we owe not only to ourselves and those who surround us, but to the long line of generations who are to follow in after ages.

The Committee, in order to carry out the views of this report, will prepare a bill, making the necessary appropriations, as soon as their object and amount shall be determined by the proper committees, and sanctioned by the House. In the mean time they beg leave to submit the following resolution :

RESOLVED, That it is not necessary or expedient to levy a direct tax.

SAMUEL B. RUGGLES,
VICTORY BIRDSEYE,
THOMAS B. COOKE,
ABNER LEWIS,
} *Committee of Ways and Means.*

March 12, 1838.

APPENDIX

REFERRED TO IN THE REPORT.

Estimate of the progress of a State Debt to the amount of Forty Millions of Dollars, and the progressive stages by which it will reach its final extinguishment.

It is deemed safe to assume, that the nett revenue from the canals, for the year 1838, will be $800,000.

It is also deemed safe to assume, that such a nett revenue will increase, for the four next years after 1838, at the rate of $100,000 per annum; and that after that time, to the end of the year 1845, owing to the completion of the enlarged Erie canal, and other works of internal improvement, and the great increase of the commerce through our public works, with the Western States, such annual increase will be $200,000 per annum; and that after the year 1845, owing to the operation of like causes, and the more extended and perfect development of the commerce and agriculture of the far West, such increase will be at the rate of $300,000 per annum, until such increase shall reach $3,000,000 per annum, which will be in the year 1849.

It will be further assumed, that the tolls will probably be so reduced, that the nett revenues from the canals will not exceed the said sum of $3,000,000; and that after the full completion of our internal improvements, the State may make such further reductions in the tolls, as the general interests and wishes of its people may require.

It is not supposed that this estimate will be found entirely accurate; or that the ratio of gradations of increase in the different years, will precisely conform to these assumptions. But inasmuch as our past experience, and a reasonable estimate of our future revenue, afford entire assurance that the estimates thus assumed for future years will fall below the actual results, it is deemed safe to proceed upon such assumptions for the purpose of the present estimate.

1. We will suppose the State, for the next ten years, should borrow four millions of dollars a year for the public service. The amount of debt to be contracted will stand as follows: At the end of the year

1838 - - - - - -	$ 4,000,000
1839 - - - - - -	8,000,000
1840 - - - - - -	12,000,000
1841 - - - - - -	16,000,000
1842 - - - - - -	20,000,000
1843 - - - - - -	24,000,000
1844 - - - - - -	28,000,000
1845 - - - - - -	32,000,000
1846 - - - - - -	36,000,000
1847 - - - - - -	40,000,000

2. It may be presumed, that the loans of the respective years, being in instalments, as the public service during the year may require, the interest on the loan of any one year will not be payable for more than six months of the year in which it is contracted.

3. Such moneys may be borrowed on five per cent. stock, not under par, and redeemable at the option of the government after 10 or 15 years.

4. The annual surpluses of income may form a sinking fund, and invested in State stock or loaned to our citizens, so as to produce at least five per cent. per annum upon their principals.

The following table is prepared, and exhibits the revenue payable in each year; the interest to be provided for in each year; the surplus revenue going to the sinking fund in each year; and the nett amount of the sinking fund at the end of each year; and the period at which the sinking fund will suffice to pay off and reimburse the whole principal and interest of the debt.

1. The nett revenue in each year will be for		2. The interest to be paid in each year will be	3. The surplus going to the sinking fund will be for each year	4. The amount of the sinking fund at the end of each year
1838	$800,000	$100,000	$700,000 00	$700,000 00
1839	900,000	360,000	635,000 00	1,335,000 00
1840	1,000,000	500,000	566,750 00	1,901,750 00
1841	1,100,000	700,000	495,087 50	2,396,837 50
1842	1,200,000	900,000	419,841 57	2,816,679 37
1843	1,400,000	1,100,000	440,833 06	3,257,513 33
1844	1,600,000	1,300,000	362,855 66	3,620,368 99
1845	1,800,000	1,500,000	480,018 44	4,100,387 43
1846	2,100,000	1,700,000	615,019 37	4,715,406 80
1847	2,400,000	1,900,000	745,770 34	5,461,177 14
1848	2,700,000	2,000,000	983,058 05	6,444,235 99
1849	3,000,000	2,000,000	1,322,211 79	7,766,447 78
1850	3,000,000	2,000,000	1,388,322 38	9,154,770 16
1851	3,000,000	2,000,000	1,457,738 50	10,612,505 66
1852	3,000,000	2,000,000	1,530,625 43	12,143,134 09
1853	3,000,000	2,000,000	1,607,156 70	13,750,290 79
1854	3,000,000	2,000,000	1,607,514 53	15,437,805 32
1855	3,000,000	2,000,000	1,771,890 26	17,209,695 58
1856	3,000,000	2,000,000	1,860,484 77	19,070,180 35
1857	3,000,000	2,000,000	1,953,509 01	21,023,689 36
1858	3,000,000	2,000,000	2,051,184 46	23,075,874 82
1859	3,000,000	2,000,000	2,153,793 74	25,229,668 56
1860	3,000,000	2,000,000	2,261,483 42	27,491,151 98
1861	3,000,000	2,000,000	2,374,557 58	29,865,709 57
1862	3,000,000	2,000,000	2,493,285 47	32,358,995 04
1863	3,000,000	2,000,000	2,617,949 75	34,976,944 79
1864	3,000,000	2,000,000	2,748,847 23	37,725,542 02
1865	3,000,000	2,000,000	2,886,277 10	40,611,819 12

Showing the final reimbursement of the whole debt in the year 1865.

N. B.—If the stock shall be negotiated at a lower rate than five per cent., or if five per cent. stocks shall command a premium, this result will be correspondingly hastened.

REMARKS.

If the revenue assumed is not overrated, and it is believed that, for the average of time, it is greatly underrated, the State has an ample provision made for the punctual payment of the interest, and the final discharge of the principal of a debt of forty millions of dollars.

Variations in the revenue received, or in the interest realized on the sinking fund, may expedite or postpone the final discharge of the debt for a very few years. But its sure and final extinguishment by the means provided may be regarded as certain.

SAMUEL B. RUGGLES,
V. BIRDSEYE,
THOS. B. COOKE,
ABNER LEWIS,

Committee of Ways and Means.

The following tables, compiled from public documents, are published with the preceding Report, for the purpose of exhibiting the progressive increase during a series of twenty years, in the official valuations of the taxable property in the city and in the State of New York respectively.

They embrace the two periods of ten years each, one immediately preceding, and the other immediately following the completion of the Erie Canal, in the year 1825.

1. Official valuation of the real and personal property of the city of New York, from 1815 to 1825, inclusive.

Year.	Real Property.	Personal Property.	Total.
1815	$57,000,000	$24,636,042	$81,636,042
1816	57,308,200	24,766,000	82,074,200
1817	57,799,435	20,996,200	78,895,735
1818	59,827,285	20,426,806	80,254,091
1819	60,500,295	18,612,766	79,113,061
1820	52,084,328	17,446,425	69,530,753
1821	50,619,720	17,665,350	68,285,070
1822	53,330,574	17,958,570	71,289,144
1823	50,184,229	20,756,591	70,940,820
1824	52,019,730	31,055,946	83,075,676
1825	58,425,895	42,734,151	101,160,040

2. The like from 1825 to 1835, inclusive.

Year.	Real Property.	Personal Property.	Total.
1825	$58,425,895	$42,734,151	$101,160,046
1826	64,912,850	42,534,931	107,447,781
1827	72,617,770	39,594,156	112,211,926
1828	77,139,880	36,879,653	114,019,533
1829	76,834,880	35,691,136	112,526,016
1830	87,603,580	37,684,938	125,288,518
1831	97,221,870	42,058,344	139,280,214
1832	104,042,405	42,260,213	146,302,618
1833	114,124,566	52,366,976	166,491,542
1834	123,249,280	63,299,231	186,548,511
1835	143,732,425	74,991,278	218,723,703

Increase in the valuation of the real and personal estate of the city, from 1815 to 1824, . . $1,439,634

Increase from 1824 to 1835, . . . $135,648,027

3. Official valuation of the real and personal estate of the *State* of New York, from 1815 to 1825, inclusive.

Year.	Real Property.	Personal Property.	Total.
1815	$239,667,218	$41,587,905	$281,255,123
1816	250,182,474	40,689,034	290,892,508
1817	265,710,214	38,457,247	304,167,461
1818	271,721,102	37,611,638	309,332,740
1819	243,942,231	37,054,513	280,996,744
1820	222,148,986	33,403,379	255,552,365
1821	207,446,531	33,199,982	240,646,513
1822	198,439,210	32,864,290	231,303,500
1823	215,238,913	46,903,723	252,142,636
1824	211,577,310	57,908,315	269,485,625
1825	199,533,471	63,893,875	263,427,346

4. The like from 1825 to 1835, inclusive.

Year.	Real Property.	Personal Property.	Total.
1825	$199,533,471	$63,893,875	$263,427,346
1826	214,802,204	64,590,093	279,392,297
1827	238,430,138	65,823,585	304,253,723
1828	275,861,471	68,785,292	344,646,763
1829	238,747,841	70,794,638	309,542,479
1830	250,975,885	68,142,411	319,118,296
1831	271,053,169	70,801,274	341,854,443
1832	294,596,149	75,956,259	370,552,408
1833	Returns incomplete		
1834	347,608,841	118,849,137	466,457,978
1835	403,517,585	125,058,794	528,576,379

Decrease in the valuation of the real and personal property of the State, in the ten years next preceding 1825, ... $17,827,777

Increase in the ten years next subsequent, . . $265,149,033

1839 (4)

Mass. General court. Joint select committee
" on the Western railroad.

HOUSE..... .....No. 32.

REPORT

ON

THE CONSTRUCTION

OF THE

WESTERN RAIL-ROAD.

Commonwealth of Massachusetts.

HOUSE OF REPRESENTATIVES, Feb. 27, 1839.

The Joint Special Committee, to whom was referred the memorial of the Western Rail-road Corporation, praying for aid, having considered the subject, submit the following

REPORT:

Fifty years have passed since the earliest explorations demonstrated the practicability and usefulness of an easy communication between the sea-board and the interior. In 1792, a charter was granted to Henry Knox and his associates, to construct the Massachusetts Canal from waters of the ocean, at Boston harbor, to the stre the Connecticut. The period when the enterprise w s first presented to public attention, was unpropitious. The wealth of the country, exhausted by the long struggle of the revolution, had no surplus capital beyond the necessities of its business. The Commonwealth had not then incurred heavy expenditure for any objects, except the security of freedom, and the preservation of government amid the civil commotions excited by the calam of a long war. The State was unwilling to aid the taking; the citizens were unable to co

its accomplishment. The projectors, after unavailing efforts, were compelled to abandon their design; the benefits of its execution were postponed; and the work of improvement slumbered for nearly half a century. At length it was revived under happier auspices. Yet, thirteen years have now gone by, since the proposal was renewed, to open a direct communication for Massachusetts with the vast regions of the west. In February, 1825, resolves of the Legislature were adopted, for the purpose of ascertaining the practicability of making a canal from Boston to the Connecticut river, and of extending an avenue for trade onward to the Hudson. The examination of the surface by the late Loammi Baldwin, under the direction of able commissioners, ascertained that such work was not only possible, but easily practicable, and its construction was strongly recommended. The Legislature, a second time, neglected the opportunity of advancing the prosperity of the Commonwealth, and refused to give that encouragement to industry which would have increased the resources and wealth of the whole community. After some interval of discouragement, patriotic individuals resolved to accomplish that work which the government had declined to assume. The superior advantages of the rail way system over that of canals, had been developed, and the advance of science had shown the claims of the former for preference. In March, 1833, Nathan Hale and his companions were incorporated, with the privilege of building a railway from the termination of the Boston and Worcester rail-road, then in progress, to the western line of the State. The Western Rail-road Corporation was organized at the commencement of 1836, with a capital limited to two millions of dollars. Evidently, the humble estimate of

the amount of funds required to carry an avenue of iron across the rivers, through the defiles, and over the mountains of New England, for the distance of an hundred and sixteen miles, was predicated on imperfect data. No experiments had then tested the cost of such structures. The moving power, then known, was less efficient, as it was less expensive, than the force of steam. Comparatively small as was the sum deemed necessary, it was not obtained, amid the doubts of the prudent and the fears of the timid, without great difficulty. Repeated appeals were required to be made to the public spirit of the citizens; meetings were held in the towns and cities, and invited in the villages; assistance was solicited and almost demanded from all classes. By unwearied and persevering exertions, the stock was at length taken up by two thousand four hundred subscribers. The subscriptions were not drawn from the abundant revenues of capitalists, seeking for safe investment of their surplus funds. They were received from the farmers, mechanics and artisans, more than from the merchants, or the professions. The prosecution of the work became the business of the men of middling interest, who felt that their welfare depended on its success, much more than of those, possessed of wealth and independent of fortune, who prudently declined the risk of loss for the hope of gain. Almost without exception, the stockholders regarded the payments they made, and the responsibilities they incurred, as contributions to the public good, of which they could partake in no larger share than others of the community who assumed no burden. When the amount originally proposed had been obtained, the corporation looked forward to the commencement of operations. On examination it was found, that to execute the work

in the manner which would make it most useful, would render greatly enlarged expenditures indispensable. The means gathered from men of moderate property, more willing than able to devote to good objects all resources, except the very means of subsistence, were insufficient to accomplish the end of the whole enterprise, in its extension to the Hudson. The directors then applied to the Legislature for aid. The act of April 4, 1836, increased the capital to three millions of dollars, and the State, with honorable liberality, subscribed for one million dollars of the stock, and became copartner with her citizens in the construction of the great work. Provision was subsequently made, April 15, 1837, for issuing scrip in payment of the advance, authorized by a policy not less generous than necessary, and for its ultimate redemption by the increase of a sinking fund. Had the prosperity then brightening the affairs of business continued undimmed, the original owners of shares might have been able punctually to meet their proportions of payments. But the season of adversity suddenly overshadowed the whole community. The general embarrassments of fiscal concerns involved many of the stockholders in ruin, and required from all the devotion of every resource for the fulfilment of private engagements. It became impossible to collect from those stripped by the storm, or from those struggling against the reverses of fortune, the assessments imposed in better times. The directors were again compelled, for preventing the entire failure of their undertaking, to appeal to the Legislature. In accordance with the sound policy directing the earliest grant for internal improvement, the government loaned its credit to the amount of two millions one hundred thousand dollars, and authorized the issue of scrip to that amount,

redeemable in London in thirty years. The premium on the sale of the certificates was appropriated, with one per cent. annually on the aggregate, to be deposited in a sinking fund. The condition was annexed, that the stockholders must raise ten per cent. on their capital, before they should avail themselves of the loan.

Under the management of faithful directors selected by the corporation or elected by the State, and of a board of engineers of reputation as high and skill as perfect as any of the United States, the road has been prosecuted with vigor. Eastward of Connecticut river, from Springfield to the termination of the Boston road at Worcester, the whole extent has been not only put under contracts, but their completion is so far advanced, that the whole distance may be opened for travel before the first day of September next. In conformity with the express direction of the Legislature, "to commence the construction of such part of the road between Springfield and Pittsfield, as must require the longest time for its completion, and to prosecute the same in such manner as to ensure the finishing of the whole to the western line of the State as early as practicable with due regard to economy," thirty-four miles, where the heaviest labor was needed, were put under contract, extensive operations commenced, and large expenditures incurred. If the directors could now rely on obtaining the funds they require to enable them to proceed with confidence, the whole internal communication between the ocean boundary and the western line of the State may be completed within two years. Preparations have already been made for its further continuation. The Hudson and Berkshire Rail-road from West Stockbridge to the North river, is actually open to receive the passengers and merchandise borne from Boston

to New York. The friends of the Albany road have adopted such measures to protract the Western way directly on its course, and to secure the establishment of another link of connexion during the present year, as leave little doubt that it will be made ready before the road of Massachusetts can be prepared for union.

Six assessments have thus far been laid on the stock, separately producing one hundred and fifty thousand dollars each, collectively yielding nine hundred thousand dollars. The State, as subscriber, has contributed her share of three hundred thousand dollars; and six hundred thousand have been actually paid by individuals, with the exception of comparatively small arrears, daily reduced, and now about eighteen thousand dollars, so secured as to render the ultimate advancement certain.

If the twenty-two hundred present owners of stocks were wealthy capitalists, the funds they have become bound to furnish might be provided to enable the corporation to complete the road, at a period as early as due regard for economy would permit. Unfortunately, the calamities pressing on all, visited most severely on men of moderate estate, have exhausted their ability to bestow charities on the public. Some, more fortunate than their associates, escaping from the ruin of the great financial convulsions, are as willing as they are able to discharge their obligations. But the attempt to collect any considerable amount from the private stockholders would be entirely unavailing. If enforced by the rigorous process of the law, it would bring severe suffering on worthy citizens. If prosecuted by a sale of the shares of delinquents, it would only effect the sacrifice, by those unable to sustain further losses, of a large part of the sums already advanced. In either mode, the result would be a public wrong. It

would inflict new calamities on those who have scarcely yet recovered from the misfortunes of the past. If it could be successful, it would withdraw so much capital as was obtained, from useful employment in active business to permanent investment. In ordinary times, the sum required might be taken away from trade, agriculture, or manufactures, without producing perceptible depression. But when the whole energies of the community are needed, as they are directed, for recovering the prosperity overthrown by reverses as unexpected as unmerited, it would be unreasonable and unjust to increase the weight which has almost pressed the strength of industry to the earth, and crushed beneath it the vigor of enterprise. If temporary relief can be afforded, that industry will recover from its fall; that enterprise, rising with renewed elasticity from its depression, will afford its propelling force to business. Both will unite to produce that condition, in which, without any extraordinary exertion or suffering the moneys now deficient, may be provided.

Under these circumstances, the corporation ask from the Commonwealth the assistance of a loan of credit to enable them to complete the road at an early period. In substance, they request the government to become endorser for her own citizens to such extent as will enable them to accomplish the undertaking so far prosecuted with success by the union of their own exertions and the bounty of the state.

If the application could rightly be regarded as placed on the narrow ground of a business transaction between individuals, forgetting the obligation of government to provide for the common welfare, the relation of Massachusetts to the Western Rail-road Corporation would be analogous to that of the substantial capitalist solicited to lend

to his neighbor, who possessed more enterprise than means. The loan to be made must be proportioned to the wants of the applicant to the security proposed, and to the degree of probability of repayment.

Considering the subject in this restricted and most limited view, the first inquiry presented would reach only to the immediate wants of the corporation.

All the means derived from former loans of the State, and gathered from payments of the stockholders, it is well ascertained, will be insufficient to complete the Western Rail-road. From the ending of the Boston and Worcester road to Springfield, through fifty-four miles, it will be completed during the present year. Beyond the Connecticut, it can be extended 28 miles to the eastern base of the mountains of Berkshire: from their western slope it can be carried forward to the line of the State. There will remain a portion partially worked, among the highlands so beautifully sketched on the plan exhibited for public inspection, illustrating the difficulties interposed by the rocky ranges and lofty elevations, and the skill of the artist by whom they have been delineated. This must be left unfinished. In the great chain of internal improvements one link must be wanting to complete the extent of its circuit.

Even if the employment of the whole resources the corporation can command from its members or claim from its copartner and associate, the State, might accomplish so much of the road as has been described, it could only be effected under serious disadvantages and with heavy sacrifices. Without certainty of being provided with funds to meet their engagements, the directors must decline to enter into contracts for labor or materials, however beneficial may be the proposals offered. When their means shall have been exhausted, they must discharge the skilful ope-

ratives long employed in their service, disband the corps of superintendents and engineers, and suspend all those arrangements, which can now be successfully and cheaply carried forward to their result. After such event, if the construction of the deserted road should ever be resumed, other agents must be employed, and new workmen collected at great cost, and the whole must be executed with less economy and perhaps less excellence, than by continuing the present effective operation. To the stockholders and the State, the delay would cost the loss of interest on their outlay: to the community the loss of an early and easy communication with the great marts of trade.

Minute and particular estimates of the sums necessary to complete the whole road for the locomotives, have been made by the engineers, and carefully revised by the directors. They include every known item of charge, from the removing the earth to laying down the iron.

They have been founded on the skill, and corrected by the experience, gained by two years of practical operation. Liberal allowances for contingences have been given. Predicated as the calculations are, for the most part, on contracts actually completed or offered, it is believed that they may be received with confidence. By the largest estimation, the whole amount needed to finish every part of the work, and enable the steam horse to travel at speed from Boston to the line of the State, cannot exceed fifteen hundred thousand dollars. That sum has been stated by the memorialists, to be the utmost limit of their wants. It was ascertained that a portion of this, could, by sufficient exertions, be derived from the stockholders by levying new assessments. With such deduction, it was assumed, that the real necessities of the corporation might be effectually relieved by obtaining a loan of twelve hundred thousand dollars.

Having determined what were the wants of the borrower, the next inquiry was, as to the security which could be given for an advancement. The corporation offered to mortgage their road, extending one hundred and sixteen miles, almost through the whole extent of Massachusetts, subject only to the prior incumbrance created by the act of the Legislature, as the pledge for repayment.

The structure itself was described to be of the highest value. It was represented by those who had traversed and examined the whole extent, and who were fully competent to judge of its quality, as being of the most permanent and excellent character, built not only for the present time but fitted to endure through centuries. The route selected was that best suited for the construction and for public convenience. The massive masonry, wide excavations, long drawn embankments, and solid workmanship, were all adapted to use and durability.

The nature of the country made it impossible to avoid higher grades than have been needed on roads traversing a more level surface: but it was clearly shown that the steepest elevations of the line could be surmounted with little practical difficulty by the increased power of the engines provided.

A material element of the value of such work, of course, must be sought in the expected income. Where no actual experience has afforded the light of its results, the probable resources can only be inferred from estimates of transportation and comparison of the charges of other works. The statistics of existing employment, the accounts of the roads already open, and the opinions of men of extensive observation, concur in affording testimony, that on the expenditure of four millions five hundred thousand dollars, it is reasonable to expect a liberal and

progressively increasing income, ample enough for the disbursements to maintain the road, and yielding a surplus for keeping down the accruing interest of the loans.

Looking onward to the future, the expansion of business must be productive of immense revenues. On every railway yet opened, the actual transportation has far exceeded the recorded estimates formed on that existing in any period previous to their construction, and has been constantly increasing. Railways universally have created the means of their own sustenance, and have drawn to their tracks employment for their motion. If the beneficence of Providence had hollowed a channel from our coast to the western lakes, and poured the floods of those inland seas eastward to the ocean, the blessings would have been too great for sufficient gratitude, as they would have been beyond all computation. The river, swelled by tributary streams from every valley, would have scattered wealth along its course. For all practical purposes, the invention of art bestows better advantages, and furnishes communication more easy and certain than the bounty of nature could give. During the stern winter of our climate, the rivers are closed for one-third of the year with ice: in summer, they are exhausted for a nearly equal period: their navigation is bounded by the hills that supply their fountains. The rail-road is neither locked by cold, nor dried up by heat, nor confined by ridges. Stretching out its arms to every town and village, it may be extended beyond the highland barriers of water passage, and beyond the lakes, until its iron bands clasp together in a net-work of improvement overspreading the whole Union.

With such capacity of extension, when the Western Rail-road shall join its connecting links to the chains of communication stretching towards the far West, and

opening ways by which the business of its increasing population may pass to our manufactories and workshops, it is not unreasonable to expect, not only payment, but profit from its revenues.

In addition to the mortgage of the structure, on which nearly six hundred thousand dollars of private property have been already expended, and at least one hundred and fifty thousand dollars more from the same source must be invested, provision has been made for the redemption of the loan by a sinking fund. Doubtless, the idea of creating from an advancement the means of its own repayment, will seem to many to be visionary. Facts and figures, whose results, rightly applied, are the surest evidence of truth, show the value of this security. The correctness of the elaborate calculations entered into by those skilled in finance, has been, to some extent, verified by the arrangements, now completed and certain, in relation to the loan granted by the last Legislature. Eight hundred and thirty thousand dollars of the scrip received of the State, has been sold at an advance of more than eleven per cent., producing a profit for the sinking fund of $92,884 65. As no material variation of exchange is anticipated, the same rate of premium may, doubtless, be obtained on the residue of the twenty-one hundred thousand dollars, already authorized to be loaned. Assuming these premises, the whole amount deposited by the corporation with the treasurer of the Commonwealth, from the sale of the certificates, will be two hundred and thirty-one thousand dollars, forming a capital to accumulate. If placed on the interest of only five per cent. per annum, at the expiration of thirty years when the credit expires, it will have increased to $998,360, being nearly one half of the original liability of the State. It is provided, that after the road shall have been completed

and opened for use, one per cent. on the scrip issued is to be yearly paid into the sinking fund. At the termination of the same period of thirty years, this deposite, with the accruing interest, at the same low rate of five per cent. interest, will have accumulated to $1,205,786 45. The whole amount derived from the reproductive capacity of the two capitals, will then be two millions two hundred and three thousand dollars, repaying the first advancement, and leaving a surplus of more than one hundred and three thousand dollars to meet the expenses of management, investment, and remittance. The same principles and modes of computation, applied to any new loan, will demonstrate how certainly it may be extinguished. If the higher rate of interest readily to be obtained, were to be applied, the aggregate of profit would be much enlarged. As to one part of the resources of compensation, there need be no place left for disappointment. The premium on the scrip is made secure by the actual receipt of the proceeds. If they shall be negligently kept or improvidently wasted, it can only be by the deficiency of ordinary prudence. The other feeder of the sinking fund must necessarily be supplied by the ability of the corporation to discharge the annual interest of five per cent. on the loans of the State, and to derive from the income of the road one per cent.

In the ultimate safety and productiveness of the joint securities proposed—in the pledge of the work in which the credit of the State and the capital of the citizens, the contributions of the stockholders and the loans of the government, are all to be invested—and of the funds provided for repayment,—that degree of confidence may be entertained which approaches to certainty.

Having ascertained the wants of the borrower, and the

value of the security, it remains to consider the expediency of granting a loan.

The road in which the State has already embarked so large an investment, is still unfinished. The same sound policy which would induce the private lender to increase the solvency and strengthen the ability of his debtor, may be applied to the Commonwealth. It is sure, if the work shall be completed, it must be with her aid. Economy requires, that the amount she must finally pay should be advanced at the earliest period which will enable the directors to prosecute the enterprise with all practicable expedition to the conclusion. By enabling them to avail themselves of the condition of the market in the purchase of the materials, and of the employment of labor at a period when its hand is less busily occupied than in seasons of greater general prosperity, the whole may be completed in the most prudent as well as in the most rapid manner.

The credit of Massachusetts is high abroad, and foreigners seek the security of her scrip for their surplus means. While the funds can readily be obtained, it will be wise to avail ourselves of the present certainty of obtaining the supply required, rather than to trust to the contingencies of the future. Any event which should interrupt the peaceful relations of the nations, might deprive us of the power to draw from the wealth of the old world the capital to be employed in swelling that of the new.

There are higher considerations and wider views which bear on the question. The Commonwealth may deal with the people with a more generous spirit than the money lender's rule of caution. She may venture to advance the interest of her people by a policy as enlightened as it is liberal.

The Western Rail-road traverses a country of rugged surface. It penetrates among those mountain ranges stretching along parallel with the sea-coast, and opens an avenue where none convenient for use heretofore existed. The very features of nature which present such physical obstacles, will increase its usefulness. The hills cut through by its grading, pour the waters from their slopes to form or swell the streams that turn the wheels of mechanic industry. When a cheap and expeditious transportation shall be established, the valleys now wild, may be filled with the villages of the manufacturer, and the fields now rough, grow beautiful under the hand of cultivation. In every waterfall there is a productive power, now idle, which can be called into useful exercise, whenever a way is provided, for the passage of its fabrics to their market. If no pecuniary revenue was to be derived to the State, and no redemption of its mortgages to take place, remuneration might be sought in the appreciation of the value of the soil,—in the facilities afforded to the farmer to purchase, at diminished cost, every article of necessity or luxury brought from abroad—in the development of new resources—in the increase of population and of prosperity.

Massachusetts has too long neglected effectually to protect the industry of her citizens, by providing for them those means of improvement which are beyond the power of private enterprise. The energy of her population, subduing discouraging obstacles and triumphing over disheartening difficulties, has advanced the common prosperity, and accomplished results wonderful to contemplate. With commerce extending to every sea, with fisheries yielding ten millions of dollars, and manufactures annually producing nearly ninety millions, her soil

does not afford the bread stuffs for the sustenance of her people. Scarcely one third part of her whole territory is under cultivation, and of the portion subdued by the plough few acres yield to the tenth part of their productiveness. Whatever expenditure may invigorate the hand of industry, will be repaid by the boundless increase of public wealth and private prosperity.

The season of deliberation has been protracted through half a century, and Massachusetts has already lost, by the delay, millions on millions of wealth which might have been gained, and thousands from her population who might have been retained. It is now the time for action. It has become the duty of the Legislature, for it is the interest of the people, to speed the work of improvement with energy and decision. If there ever was a point where hesitation was justifiable and proper, it was before the government or the citizens had invested large masses of capital, or risked extensive credits. When the subscription of one million of dollars was made to the Western Rail-road, if the faith of the State was not directly pledged to the completion of the work, the pecuniary interests of the Commonwealth were deeply involved in its success. It cannot be left unfinished. The hand has been put to the plough and it must be speeded on its way.

Instead of mourning over the diminished revenues, and swelling the aggregate of public debt by expensive and unavailing lamentations over its amount, it is permitted to the Legislature to replenish the streams of income, partially exhausted under the unhappy influences of the times, by affording that aid to business which shall feed the springs that supply the treasury.

The memorialists do not ask the payment of a dollar

from the public funds; they request that the State shall come in to relieve her own citizens from embarrassments, by giving credit and currency to the paper for which they are to provide the means of redemption: even if a direct draft on the treasury were contemplated, it might safely be honored. It has become fashionable to represent the State as impoverished by her actual expenditures and her loans of credit. With the hundreds of millions of property, uncounted for eight years, swelled by vast additions since they were last enumerated, Massachusetts is neither bankrupt nor poor. If her revenue has been suddenly diminished by the adversity of her people, their renewed prosperity will restore its fulness. If there are one or two, or three hundreds of thousands of debt, that debt has been well and worthily incurred. It has been contracted for the establishment of those noble charities alleviating the heaviest afflictions of humanity—for the diffusion of knowledge by the system of education—for sustaining the militia, the arm of national defence and social production, which gives to the citizen the confidence of strength, and to the foreigner evidence even when it does not strike, there would be perilous vigor in the blow he might provoke—for encouraging the cultivation of her fields and increasing the sheaves of grain—for making wise and wholesome laws by that large assembly whose numbers make the action of the public will most true and perfect. It would have been pleasant to add, that even larger obligations had risen from liberal appropriations to works for the common good. For debts, springing from such uses, the people will cheerfully contribute. Whenever resort shall be had to the honest policy of taxing directly the consumption which is now burdened by a circuitous process, debt and

liability, can be swept away by those assessments, in former time so light as not to be felt when imposed or missed when withdrawn, and always freely paid. But there is no need of falling back upon the reserved resources of the government deposited with the citizens. The vast mass of property, accumulating as it is rolled forward by enterprise, is substantial and permanent security for the safety of anticipating the revenues of the future to meet the exigencies of coming years, and to transfer a portion of the burden of constructing great public works to that posterity who will most enjoy their benefits.

Experience has been constantly teaching the effect of internal improvements. One lesson is found in the fact, that the valuation of the real and personal property of the state of New York, decreased by eighteen millions of dollars in the ten years preceding the opening of the Erie canal, in the ten years next succeeding, had been increased by nearly two hundred and sixty-five millions of dollars. The statistics of our own Commonwealth, unfortunately of brief existence, as to public works, confirm the same instructions given by the examples of other states.

It is as unnecessary as it would be impossible, without swelling a report to a volume, to illustrate further the beneficial effects of those internal improvements which add to the prosperity of every class of the community, from the mariner who reaps his harvests on the fields of the ocean, to the husbandman who binds up the wheat sheaves on the hill sides.

The Committee were directed to consider the expediency of the purchase, by the Commonwealth, of the Western Rail-road. They were of opinion, that it was

not desirable, while the work remained unfinished, for the State to become the owner. Under the management of the agents of the corporation, it can be carried forward with more of expedition and economy, than by the public officers. If the right of acquiring the whole property at any time is reserved, it may be exercised when the heavy labors of construction are ended, and in return for the help proposed to be bestowed, it may yield large revenues for the support of the government.

After careful examination and long deliberation, it was determined to recommend the loan of such sum as was necessary to complete the Western Rail-road, not exceeding however the amount of twelve hundred thousand dollars. The conditions and limitations which it was thought fit to impose, are embodied in the accompanying bill.

It provides, that the treasurer of the Commonwealth may issue scrip, for a sum not exceeding twelve hundred thousand dollars, redeemable in London at the end of thirty years, and bearing the interest of five per cent. payable semi-annually.

When two-thirds of the amount of scrip created by the act of Feb. 21, 1838, shall have been expended in the construction of the road, then a further sum of four hundred thousand dollars, in scrip, may be delivered to the corporation. When the private stockholders shall have paid, on their part, seventy-five thousand dollars, a further loan of four hundred thousand dollars may be made; and when seventy-five thousand dollars more shall have been collected from the same stockholders, such additional sum may be advanced, as shall be then ascertained, by the governor and council, to be necessary for the entire finishing of the road.

The premium on the sale of the scrip, and one per cent. of its whole amount annually, are to be invested, to create a sinking fund for the redemption of the loan.

The corporation, before availing themselves of the benefit of the act, are to give bond, secured by the mortgage of their road, faithfully to expend the sums they may receive from the State, in the construction of the road, and to indemnify and save the Commonwealth harmless from the payment of the principal or interest on the scrip.

The right is secured to the Commonwealth, at any time, to purchase the franchise and property of the corporation, by reimbursing to the stockholders the sum actually paid by them, with interest at the rate of ten per cent. annually.

Four of the nine directors are to be chosen annually by the Legislature.

Such are the features of the bill, which it is hoped will be as acceptable to the representatives of the people, as it must be beneficial to the State.

All which is respectfully submitted.

For the Committee,

WILLIAM LINCOLN.

Commonwealth of Massachusetts.

In the Year One Thousand Eight Hundred and Thirty-Nine.

AN ACT

To Aid the Construction of the Western Rail-Road.

BE *it enacted by the Senate and House of Representatives, in General Court assembled, and by the authority of the same, as follows*:

SEC. 1. The treasurer of the Commonwealth is hereby authorized and directed to issue scrip or certificates of debt, in the name, and in behalf of the Commonwealth, and under his signature, and the seal of the Commonwealth, for a sum not exceeding one million two hundred thousand dollars, which may be expressed in the currency of Great Britain, and shall be payable to the bearer thereof in London, and bearing an interest of five per cent. per annum, payable

semi-annually in London, on the first days of April and October, with warrants for the interest attached thereto, signed by the treasurer; which scrip or certificates shall be redeemable in London, at the end of thirty years from the date thereof, and in no case exceeding thirty years from the first day of October in the year one thousand eight hundred and forty, and shall be countersigned by the governor of the Commonwealth, and be deemed a pledge of the faith and credit of the Commonwealth for the redemption thereof. And the treasurer of the Commonwealth shall, under the conditions hereinafter provided, deliver the same to the treasurer of the Western Rail-road Corporation, for the purpose of enabling said corporation to complete the Western Rail-road.

Sec. 2. Whenever it shall be made to appear to the satisfaction of the governor and council that at least two-thirds of the last instalment of the scrip authorized to be delivered to the treasurer of said corporation, by the act passed February 21st, 1838, shall have been expended or appropriated, as is required in the second section of said act, then a part of said scrip hereby authorized to be issued, to the amount of four hundred thousand dollars, shall be delivered to the treasurer of said corporation. And when the said corporation shall have laid an assessment of five per cent. on the capital stock owned by the private stockholder, to be expended on the construction of said road, and shall have collected seventy-five per cent. of said assessment, amounting to the sum of seventy-five thousand dollars, and shall have filed a certificate thereof in the office of the treasurer of the Commonwealth, signed by the di-

rectors of said corporation, the said scrip for a farther amount of four hundred thousand dollars shall be delivered to the treasurer of said corporation. And when the said corporation shall have laid a further assessment of five per cent. upon the capital of the private stockholders, to be expended as aforesaid, and have collected seventy-five per cent. thereof, such part of the residue of said scrip, as shall, in the opinion of the Governor and Council, in addition to said assessments, be necessary to enable said corporation to complete their road and put the same in full operation, shall be delivered to the treasurer of said corporation. And if the said corporation shall give security to the satisfaction of the Governor and Council, for the payment of any part of the assessments in this section required to be collected, such security shall be deemed equivalent to the payment of the amount so secured.

SEC. 3. The premium or profits on the sales of said scrip, shall, when received, be paid to the treasurer of the Commonwealth, by said corporation. And after their said road shall be opened for use, a sum equal to one per cent. on the amount of the scrip, which shall be delivered to the treasurer of said corporation by virtue hereof, shall be annually set apart from the income of said road, and paid to the treasurer of the Commonwealth; and the whole thereof shall be added to the sinking fund of said corporation, and be managed, invested, and appropriated as is provided by law, in relation thereto.

SEC. 4. This act shall not take effect, until said corporation, at an annual meeting, or at a special meeting, duly notified for that purpose, shall have

assented to the provisions thereof, and shall have executed to the Commonwealth, a bond, in such form as the attorney general shall prescribe, conditioned that said corporation shall comply with the provisions of this act, and shall faithfully expend the proceeds of said scrip, in the construction of their road, and shall indemnify, and save harmless the Commonwealth from all loss or inconvenience on account of said scrip, and that said corporation shall well and truly pay the principal sum of said scrip, which may be delivered to their treasurer, punctually in London, when the same shall become due, or such part thereof, as the sinking fund aforesaid may prove insufficient to pay, and the interest thereon semi-annually, in London, as the same shall fall due; and shall also re-affirm to the Commonwealth, by a suitable instrument, to be prepared for that purpose, under the direction of the attorney general, the conveyance of their entire road, with its income and all the franchise and property to them belonging, as a pledge or mortgage to secure the performance of all the conditions of said bond: *provided*, that the Commonwealth shall not take possession of said pledged or mortgaged property, under and by virtue of said mortgage unless for a substantial breach of some condition of said bond.

SEC. 5. The Commonwealth may, at any time after this act shall take effect, purchase of the said corporation, the said Western Rail-road, and all the franchise, property, rights, and privileges of said corporation, by paying them therefor, such a sum as will reimburse them the amount of capital paid in, with a net profit thereon of ten per cent. per annum, from

the times of the payment thereof by the stockholders, to the time of such purchase. And if, on said purchase, the Commonwealth shall have paid, or shall then pay or assume to pay the scrip issued by them by virtue of this act, or of the act passed February 21st, 1838, or any part thereof, the amount which they shall have so paid, or shall pay or assume, shall not be deemed to be a part of the cost of the road, or of the capital paid in, for which the Commonwealth shall pay a net profit as above; excepting, however, such part of said scrip, as the said corporation shall, at the time of such purchase, have actually paid.

SEC. 6. Four of the directors of said corporation shall be annually chosen by the Legislature by joint ballot of the two Houses, and the residue by the stockholders at their annual meeting.

(10)

A

BRIEF STATEMENT OF FACTS

IN RELATION TO THE

WESTERN RAIL ROAD,

Corporation

FEBRUARY, 1839.

CHARTER.

Dated March 15, 1833—to construct a Rail Road from the Worcester road, through Springfield to the western boundary of the State.

Capital Stock—not less than one, nor more than two millions.

After 10 years from completion, a right in the Legislature to reduce tolls on certain conditions.

After 20 years, Legislature may purchase the road, by paying cost and 10 per cent. net annual income.

No other Rail Road to be granted from Worcester or Milbury to the county of Hampden, or from Springfield to the county of Berkshire, *within thirty years:* with power to make *branches* from the main road to any places in the towns through which the road passes, or the towns adjoining the same; also to make a branch to the southern boundary of the State, to meet a road from New Haven and Hartford.

In 1835, private individuals made extensive surveys from Worcester to Springfield, and collected statistics of business and freight.

In June, 1835, books for subscription to the stock were opened in various parts of this State, and in New York, Hudson and Albany. Great efforts were made for several weeks, but little was subscribed.

In the autumn of 1835, public meetings were held in Faneuil Hall and other parts of the State—the patriotism of the whole community appealed to—each town was divided into districts—committees were appointed in each, and personal application made to every citizen.

In December, 1835, two millions of stock had been subscribed.

January, 1836, the Corporation was organized, and the stockholders directed an application to the legislature for aid.

April 4, 1836, the capital stock was increased to three millions, and the Treasurer of the State directed to subscribe for one million of the stock, and to pay the State's share on *each* assessment, when 75 per cent. of the *same assessment* had been paid by individuals; one-third of the Directors to be chosen by the State.

PROGRESS OF OPERATIONS.

1. East of Connecticut river.

Surveys by the Corporation commenced April, 1836.

January, 1837, 20 miles put under contract for grading.

February 1, 1837, work commenced on 20 miles.

July 1, 1837, work commenced on residue.

Length of road from Worcester to Connecticut river, 54 miles.

Highest grade on do. (for a short distance) 51½ feet.

Smallest curve (for 1600 feet only) 1,146 feet radius.

Deepest cut 80 feet.

Highest embankment 63 feet.

January, 1839, 52 miles fully graded.

Grading will be finished May 1, 1839.

Masonry principally done.

Bridges half constructed, and residue now preparing.

Iron for Superstructure, purchased—for 17 miles, delivered.

Timber for do. delivered.

6 miles of track laid down.

Engines and cars contracted for.

Depot lands are purchased.

Depot buildings are advertised for.

Land damages all settled.

Road to Springfield to be opened in September, 1839, or before.

☞THE CONTRACTS THUS FAR ARE EXECUTED WITHIN THE ESTIMATES.☜

2. WEST OF CONNECTICUT RIVER.

Nearly all of 1836 and part of 1837, spent in preliminary surveys.

1. Of a south route through Lee and Stockbridge.

2. A north route through Pittsfield.

The south route was found impracticable without stationary power.

The Engineers reported in favor of the north route.

July 1837. The Directors decided in favor of do.

It has much less high grades, and much the least curvature.

The distance by this route, from Connecticut river to the west line of the State, is about 62½ miles.

The highest grade is 79 to 80 feet per mile.

The shortest curvature about 1,000 feet radius.

Deepest cut (rock) 70 feet.

34½ miles of the westerly part was put under contract and the work commenced in the spring of 1838.

It is hoped that 11½ miles from Pittsfield to West Stockbridge may be finished in 1839.

The 28 miles of the east part are now ordered to be put under contract for grading.

The whole length of the road from Worcester to the west line of the State, is about 116½ miles—and is perfectly feasible for locomotive power.

From the western termination of the road to the Hudson river, two Rail Roads were contemplated. One to the city of Hudson, thirty-three miles, is now open. The other is to Albany, about 38 miles; and assurances are given that it will be commenced the coming spring, and finished before the Western Rail Road. Both these are feasible for locomotive power.

The whole distance from Boston to Albany will not exceed 200 miles, and may be travelled ordinarily in 12 hours. From Albany to Utica, 96 miles, a Rail Road is in operation; and from Utica to Buffalo roads are now in progress, which will doubtless be in operation by the time of completion of the Western Rail Road, making about 500 miles of continuous Rail Road to the lake navigation, in about 32 hours.

Financial Department.

The stock (20,000 shares) was originally subscribed for, by over 2,200 individuals, principally in small sums, from one to twenty shares, in various towns, in eight different counties in this State, and in the State of New York.

There are now about 2,400 stockholders, mostly men of moderate property, and in active business.

In nearly every case, the subscription was made, not as an investment for profit, but as *as a contribution to a great public enterprize.*

6 assessments of $5 each per share, have been laid, making $30 per share, and including 10,000 shares subscribed by the State, it amounts to $900,000

Of this, there has been collected Feb. 28, 1839, $882,780

Balance unpaid:

On 3d assessment	2,880 00
4th "	3,995 00
5th "	4,660 00
6th "	5,685 00
	17,220 00

The State has paid $300,000 on its shares.

Cost of the road as estimated by the Engineers and Agent.

East of Connecticut river, 54 miles	$1,864,729 00
West of do, 62.6 miles	2,326,442 00
Total estimate cost 116.6 miles	$4,191,171 00

Or about $36,000 per mile.

February, 1838, the State granted their script on a mortgage of the road and its income for $2,100,000 00

Of this amount $900,000 in script has been received.

The script is payable in 30 years.

Sinking Fund.

The act of 1838, required the profit on the sale of script to be put into a sinking fund, and after the road is opened, $21,000 from the income of the road, to be annually added to this.

The whole to be in the hands of the Treasurer of the Commonwealth, and put at interest to redeem the script.

Of the $900,000 received, the major part has been sold in London, and has produced a net profit of a little over 11 per cent.

At this rate, the profits on $2,100,000 will be $231,000 00

This on interest at 5 *per cent.* only annually will, in 30 years, produce	$998,360 53
$21,000 from the income of the road annually for 27 years, on interest of 5 *per cent.* only, will produce	$1,205,425 92
Total sinking fund at the end of 30 years,	$2,203,786 45

or more than enough to meet the debt.

The semi-annual interest on the script to be paid by the Corporation out of the income of the road. If they neglect to keep down the interest, or to pay the $21,000 to the sinking fund, the State may take possession, and thus apply the income themselves.

Future Wants and Resources.

Dec. 1, 1838. The available resources were	$1,751,024 19
Wanted of this to put the road in use east of river	755,027 66
Amount applicable west of river Dec. 1, 1838	$995,996 53

If the work is carried on *efficiently*, this will be about exhausted by the spring of 1840, in the grading of the whole line and in the superstructure of 11½ miles.

And this without providing for the residue of the iron and timber and the engines and cars.

This iron and timber should be delivered in the spring and early in the summer of 1840.

But it cannot be calculated upon unless ordered 6 to 8 months before it is wanted.

To prevent delay, it should be ordered immediately.

It cannot be so ordered unless additional means are provided to pay for it.

And if the means are not now provided, there will be a delay of 12 months or more in opening the western part of the road.

Estimated income of the road from Worcester to Springfield.

Cost as per estimate 1,864,729, but say $1,900,000

In 1829, the Commissioners appointed by the State estimated and reported the merchandize at 41,533 tons
and the passengers at 23,475

In 1835, the Executive Committee for surveys on this road, after great labor and sending agents into most of the towns, estimated and reported the merchandize

at	53,400	tons
Passengers	55,510	
53,400 tons, at $4	213,600	
55,510 passengers, at $2	111,020	
Add for Mails	10,000	
Gross estimated income	$334,620	

All the expenses of the Worcester road including $15,000 for deterioration were per year	100,572	
Add for increased length of western	30,000	130,572
Net estimated income on	$1,900,000	$204,048

And this, in 1835, without the aid of opening the road west of Connecticut river.

The increase of business since 1835, and the opening of the road to Albany, and of a road from Springfield to New Haven, and the extension of this, north of Springfield, will make a vast increase of income.

Boston, February, 1839.

LETTERS

FROM

DAVID HENSHAW,

TO THE

BOSTON MORNING POST,

ON THE

WESTERN RAIL-ROAD,

AND THE GREATLY BENEFICIAL EFFECTS OF

INTERNAL IMPROVEMENT.

BOSTON:
PRINTED BY BEALS AND GREENE.
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LETTER I.

WHEELING, Nov. 20, 1838.

Here I am, fairly on the western side of the Alleghanies. I left Baltimore on Saturday morning, in our old friend Admiral Reeside's fast line, *so called.* We were promised to be brought here in fifty-two hours, and accomplished the journey in three days and three nights. Twenty-four hours of the time we had a severe snow storm on the mountains. The load was so heavy the night before last that on the steep acclivities of the Cumberland, or national, road, the passengers were obliged to walk, and in one case to put the shoulder to the wheel to aid the horses. We had a hearty laugh yesterday morning on changing coaches at Uniontown, to find the carriage that we had been pushing along up the hills, and walking up the mountains ourselves to relieve, was pretty heavily loaded with *freight boxes of fresh oysters* for Wheeling. We concluded that Admiral Reeside had improved upon the tactics of the Ohio stage proprietors, where, it is said, they oblige the passengers to walk and carry a rail with which to pry the stage out of the mud. After this discovery we declined walking.

We came to Frederick, in Maryland, on the Baltimore and Ohio Rail Road—distance by this way sixty-one miles from Baltimore, and by the old road forty-eight. Parr's Ridge, some sixteen miles from Frederick, is surmounted by inclined plains, by horse power; the highest inclination, or grade, of these plains is about 370 feet per mile. The rail-road compa-

ny are, however, now constructing a new road, of about six miles, around this ridge, which is to be finished in a few weeks. They find a route, the highest inclination being eighty-three feet to the mile, that enables them to surmount the elevation with locomotive engines. They are also in two other places cutting off curves by new pieces of road. They are likewise laying, in place of the old plate rail, new edge rails of the T pattern, weighing 55 lbs. to the yard. They intend to put the line from the present terminus of the road to Cumberland, under contract next year. It would be a great relief to travellers, crossing this formidable chain of mountains, to be able to do it by rail road. The national road from Cumberland to this place, is a good road of the kind, but it is not in all cases well located, and no common road can ever come in competition, for convenience, comfort and speed, with rail roads.

Maryland appreciates her position, and is wisely expending large sums for internal improvements to avail herself of her natural advantages.

The country around Frederick is very good, the farmers appear in a thriving condition, and large quantities of land are in cultivation for wheat. The wheat appears green and luxuriant, and if not winter killed, the crop in that quarter will be great the next year.

Cumberland is a thriving town, of some three thousand people, surrounded by lofty mountains. The mountain scenery in the vicinity is on a magnificent scale, and of the wildest and most romantic character. I regretted that I could make no stay here. Cumberland is about 150 miles from Baltimore, and near to the lines of Pennsylvania and Virginia. It is on a small stream that empties into the Potomac. The place suffered a few years since heavily from fire, and in fact has not yet fully recovered from that calamity. It is situate in the coal region, and must be greatly benefitted by the extension of the Baltimore and Ohio Railroad and the Chesapeake and Ohio Canal, which will both reach her neighborhood within a few years.

A few miles this side of Cumberland we passed over the famed battle ground of Braddock's defeat in the old French war of 1755. It was here that General Washington first shew that military sagacity and tact, which in after times so much exalted his fame, and that, on the occasion of this disaster, saved the remainder of Braddock's army. There is a monument a short distance from the road, on an eminence, that marks the place where Braddock fell.

Ten miles this side of Cumberland we reach Frostburg, a region famous for its bituminous coal. A Boston company own inexhaustible mines here, of coal of the finest quality, and when the railroad and canal shall have been brought to the vicinity, these mines must yield a never-failing profit. Coal, equal to the best Orrel coal in your market, is delivered at the houses in Frostburg at four cents per bushel.

At some two hundred and twenty miles from Baltimore, in the midst of the mountains on the western side of the Alleghany range, we reached Brownsville. It is on the Alleghany river, and built upon the site of the old frontier fort, Redstone. It is a village of about three thousand people—noted in this section for its iron works and ship building. A new steamboat, of 300 tons, built at this place, left a few hours before we arrived, for Pittsburg, by the river 55 miles distant—she was then to descend the Ohio for Louisville. The Alleghany is navigable for steamers sixty miles above Brownsville.

I noticed a beautiful iron bridge, of a single arch, some thirty feet high, supported by stone abutments, over a stream that empties into the Alleghany, at Brownsville, made by the iron masters and artists of Brownsville. The work would be considered a wonder in any part of the country.

We took our supper at Washington, Pa., a good town of two thousand people. It is in the midst of an excellent farming country—wheat commands very readily $1 12½ per bushel, which is called there a high price. Though my ride over the mountains has been a tiresome one, I have been much pleased

with it, and it has given me the desire to try the route again more leisurely at a more favorable season of the year.

Wheeling, on the Virginia bank of the Ohio, has grown much of late years, and now counts a population of nearly or quite, ten thousand. It is surrounded by a good farming country. Its population is a busy and thriving community. There are four iron factories, two steam flouring mills, and some ship building, carried on here. The handicraft trades employ, advantageously, many of its citizens. It is a thriving, but not a handsome, place.

LETTER II.

Louisville, Nov. 29th, 1838.

I descended the Ohio, from Wheeling, on the 20th, in the steamer Brownsville, owned and built at Brownsville, formerly Redstone. The boat was crowded with passengers, and almost sinking with freight; wet, dirty, and uncomfortable. It was the best of the two that were in port. The weather was inclement, and the season quite unpropitious for enjoyment. The Ohio is a beautiful river, not averaging, I think, more than eighty rods wide above Cincinnati. The shores are generally settled, and every four miles, on either side, a village is seen, decorating the river's bank, many of them handsome, and most of them flourishing. Some of the more important points we passed in the night, including Marietta, Guyandotte, and Portsmouth. Maysville, on the Kentucky shore, some sixty or seventy miles above Cincinnati, numbers about 3000 people, is surrounded by a fertile, farming country, and is a place of business and note. While our boat was discharging freight, and landing her passengers for this place, I had time to walk up in town, and to examine, as the greatest lion in the place, a "Pork House"; in other words, a slaughter-house for hogs. There are two in this place, at which are killed and dressed about twenty thousand hogs during the pork season. Sixty

men were employed in the one I visited, and the whole operation of killing, (knocking the hogs in the head,) scalding, cleaning, dressing, cutting up, assorting, packing, trying and straining the lard, pressing the scraps, cleaning the sausage skins, was going on actively, under the eye of a fat jolly superintendent. There were about 250 pigs strung up to drain and cool, that had been killed and dressed that morning. The pork is small, the pigs not averaging, I think, 200 lbs. and cost 3½ to 4 cents per lb. The salt is procured from the Virginia Springs, on this side the mountains, which, since they have commenced making it by solar evaporation, is very good.

The shores of the Ohio give ample proof of the wonderful industry of its inhabitants. It is but about sixty years since the first attempts were made to settle its banks,—it now smiles, with farms, habitations, villages, and cities. There is a marked difference, however, in the improvement of the two shores. In passing from the United States to Canada, one would suppose that he had entered a new region, differing widely in soil and climate from the one he had left a few rods behind him; something of the like kind, though not to the same extent, is observed on the two shores of the Ohio. In both cases the scenes bear testimony to the value of *free* institutions in elevating and improving the moral and physical condition of man.

Cincinnati is a beautiful city, truly "the Queen of the West." It has now nearly 45,000 people. It is laid out in regular squares—ascending somewhat abruptly from the river. There is much wealth, great activity, and an extensive business there. Many of the private dwellings rival in elegance and cost your Beacon street, Summer street, and Tremont street, residences—and are furnished as sumptuously as the best houses in the Atlantic cities. In fact, I think the general style of furnishing is more costly than with you.

They are displaying a good deal of taste, and incurring great expense, on some of their public edifices. The country around Cincinnati is rich, and in high cultivation. A canal is made to Dayton and Piqua, some 80 miles, and is to unite at

Defiance with the Wabash and Erie Canal, and will thus open a communication with Lake Erie by the Maumee Valley. This artificial tributary pours the vast amount of produce from the bordering country into Cincinnati. It is also in contemplation to run a railroad from Cincinnati to Lake Erie—when this is completed, they can reach the lake in about twelve hours, Buffalo by steam in thirty hours from the lake end of the road, and, when your great Western Railroad is done to Albany, they will go from Buffalo to Boston in thirty hours, at the rate of twenty miles per hour, making seventy-two hours from Cincinnati to Boston. The time is not far distant, if Massachusetts does her duty to herself, when she will come in for a large share of the trade of these vast regions, by the way of the lakes.

A road is commenced from Madison, Indianna, about fifty miles above this place, to Indianapolis, ninety mile distant. Twenty miles and upwards are already completed, and the residue is to be done next year. The road was formally opened on Monday last. The Benj. Franklin, steamer, that I came in from Cincinnati, took on board a goodly number of young people of both sexes at Nevay, and left them at Madison to join in the celebration, and the ball that was to follow in the evening. They were anticipating great doings and much pleasure. Indiana will, it is said, soon have a road from Indianapolis to the lake. Madison is a thriving village of nearly 3000 inhabitants; many of them Yankees, possessing intelligence, enterprise, and industry. It will become a large place. New England habits, spirit and industry, are visible in many of the towns along the Ohio river. In fact, where the Yankees settle in any numbers in the west, the place is sure to thrive.

The weather is pleasant, but dry and cold. Ice is making in the river to day, but none to impede navigation.

The low stage of the Ohio for months past, put an effectual embargo on all business. Merchandise, manufactures, produce, all remained on the hands of their owners. A good deal of pecuniary embarrassment has been the consequence; business, however, is very brisk.

LETTER III.

Louisville, Dec. 3, 1838.

This city is an important point on the Ohio river, and in fact it maintains a proud eminence in the great Valley of the Mississippi. Important, however, as it is, the people of the East, generally, are ignorant of its history, its resources, and even, in fact, of its location. It is situated on the right, or Kentucky, bank of the Ohio, at the Falls. Thomas Bullitt purchased the site of the Indians, and "located" the town in 1773, but died before effecting any settlement. Geo. R. Clarke erected a rude stockade first here in the fall and winter of 1778 and 1779. Clarke's known courage, energy and prudence, inspired confidence in his success, and drew settlers to his encampment. The place, however, besides being a frontier post, liable to the inroads of the savage, was proved to be sickly, so that, as late as the year 1800, Louisville numbered but 800 people. About fifteen years ago, the low grounds in the rear of the city were drained, and the place has since become remarkably healthy. It is now supposed to contain nearly 30,000 people, including about four thousand blacks. In 1830 it had but 10,000 people.

The city is laid out in squares—the streets are wide and handsome, running parallel with the river one way, having cross streets at right angles with these.

The most important public work here is the Louisville and Portland Canal. There is a fall of twenty-six feet in about two miles distance on the river, from the upper part to the lower part of Louisville, called Portland. The Canal Company was incorporated in 1825, and the Canal opened for use December, 1830. There are one guard and three lift locks; the guard lock is 190 feet long in the clear, with semi-circular heads of twenty-six feet diameter, fifty feet wide and forty-two high. The lift locks are of the same width of the guard lock, twenty feet high and 185 long. There is a beautiful stone bridge

thrown over the canal about mid-way, with one main and two small arches—the first is sixty feet span and sixty-eight feet high—the side arches are forty feet span. There are besides three culverts. The walls of the canal are 921 feet long, and the whole work has required nearly 42,000 perches of masonry. The whole cost $750,000. Tolls, sixty cents per ton for steamboats, and three cents per foot for keel and flat boats. The canal is very profitable, giving the stockholders, I am informed, about nine per cent. semi-annually, and leaving a surplus for future improvements. The stockholders are not allowed by their charter to receive more than eighteen per cent. yearly.

There are turnpikes from this city to Frankfort, Bardstown, and Elizabethtown. They talk of a railroad from this to Nashville—one from Jeffersonville, on the opposite side, to the interior of Indiana, and another to Alton, all of which, as the country advances in wealth, will no doubt be completed.

There are several handsome public buildings, but generally the edifices are not costly or handsome. The county is now building a very large and costly Court-house, at an expense of nearly half a million of dollars, it is said, in the hope of getting the seat of government fixed here.

Fulton made his first unsuccessful attempts to navigate the western waters by steam in December, 1812, in a boat, the Orleans, of 400 tons, built at Pittsburg. He reached New Orleans, but had to leave his boat there, being unable to ascend the river with her. There are now on these waters 375 steamers, varying in size from 50 tons up to 600 tons burden.

There is a good share of banking capital in this city. The Bank of Kentucky has a capital of five millions—the Northern Bank three millions—the Bank of Louisville two millions. There are, besides, the Louisville Savings Institution, and the Mechanics' Saving Bank. There are five Insurance Companies, viz: the Firemen's Insurance Company, the Franklin Insurance Company, the Louisville Marine and Fire Insurance Company, the Merchants' Louisville Insurance Company, and

the Portland Dry Dock and Insurance Company—each with a capital of $100,000. There are also agencies for the Spring Garden Insurance Company, of Philadelphia, the American Life and Trust Company, Lexington Fire, Life, and Marine Insurance Company, the Baltimore Life Insurance and Trust Company, and the Ætna Insurance Company, of Hartford.

The number and the capital of these institutions will serve to give you some idea of the importance of Louisville in a commercial point of view. It is stated that in the year 1837, a year unfavorable to trade, there were 3200 tons of iron used and sold in Louisville—39 millions feet of lumber, 20 millions of shingles, ten thousand cords of wood, seven hundred thousand bushels of coal, two hundred thousand bushels of salt, twenty-five hundred hogsheads of tobacco, &c. There are large quantities of hemp raised in this vicinity; clean hemp is worth about $100 per ton—large quantities of bale rope and bagging are made in the neighborhood. Good, judicious cultivators, it is said, can clear one hundred dollars an acre per annum, in raising hemp, at the present price, or in raising tobacco at 12 cents pr lb. The "pork houses" pack about 35,000 hogs a season. Louisville, you will remember, is but a single small point in the vast valley of the Mississippi.

New England, and yet more, Massachusetts, might reap rich harvests from these fertile fields, if they would seek a knowledge of them, and cultivate a trade with the people who inhabit them—yet how little do our people know of them! You can communicate with them by way of the lakes, and a railroad from Buffalo, Albany, and Boston, saving the dangerous travel over the mountains, quicker and better than Philadelphia or Baltimore, and as quick as New York. If the people of Massachusetts consult their own permanent interests, they will hasten to complete their road to Albany, and will lend all reasonable aid to open a road from the Ohio river to the lake.

There are fifteen white, and one African, churches in the city, of various denominations, and several religious and charitable societies, all evincing the prevalence of an elevated mor-

al and religious feeling in the community. The institutions of public worship stand permanent among the beneficial arrangements of a civilized society. I think little of creeds or rituals, and far too many of the preachers of our day, and our land, are men of humble intellects, and bigotted feelings. But the benefits of public worship are not so much in the preaching, as in the association of men at the altar. Congregate men of all ages in a church at stated periods—assemble both sexes, dressed in clean habiliments, on a level, at the altar of God, and though there were not a word spoken—as is the case at a Quaker meeting—nay, even if error be preached to them, they will still improve in their kindly and social feelings; they will rub off, as it were, by attrition, the rough points of character that are sure to show themselves in those living rural or secluded lives. Error, if preached, will soon lose its influence, and be forgotten; while the good will remain, and promote the lasting improvement of society. We, of the east, think lightly of western morals; were we better informed, we should perceive, that with some difference, the habits and usages, between the two sections, there is really little difference in the high tone of moral feeling which pervades the community on either side to the Alleganic ridge.

The collegiate institute of Louisville, recently established, is designed to educate young men in the higher branches of learning, and with reference to our political, moral, and social systems. Our older colleges in the east would much improve if they were to *Americanize* themselves a little. There are seven free schools in this city, and many private instructors, among the most distinguished and successful of the latter in this city, and, in fact, I may say the State, is Francis E. Goddard, Esq., formerly of your city.

The Louisville Medical Institute was chartered in 1833, and went into operation last year, with a class of eighty pupils. They have a fine new building nearly completed, said to be one of the best planned buildings, for the purpose, in the country. Dr. J. B. Flint, late of your city, a gentleman of the

most estimable character, a high order of talents, and distinguished professional attainments, is the Professor of Surgery. He visited Europe, last year, to procure instruments and books for the Institute. This medical school bids fair to take the lead in this section of the west.

There are about sixty doctors, and nearly as many lawyers, in Louisville. The professions are crowded.

Having, in this hasty scrawl, about filled my paper, as you will perceive, I have to bid you farewell.

LETTER IV.

PEORIA, DEC. 26, 1838.

Having a leisure day, while waiting for the stage to take me to Galena, I embrace the opportunity to give you a sketch of the plans of internal improvements adopted by the State of Illinois, and now in progress to completion.

The first project is to unite the waters of Lake Michigan with the Illinois river, by a canal, and by that river with the Mississippi. This work commences on the north fork of the south branch of the Chicago river, at its navigable point, four miles to the south-west of Chicago, and extends seven and a half miles to "The Point of Oaks," on the river Des Plaines, and down the valley of this river to the end of the lake level, twenty-five miles, to a new town called Lockport. Here are two locks, of ten feet lift each, by which a very valuable and inexhaustible water power is obtained, from the waters of the lake. From Lockport, the canal is to run in the same valley, to Juliet, crossing the Des Plaines here, by a dam, thence passes Marseilles and crosses the Fox river, by an aqueduct, between the main bluff and Ottawa. A navigable feeder connects it with the rapids of Fox river, four miles above Ottawa, and extends through the town to the Illinois river. The canal passes down the right bank of the Illinois, below Ottawa, to a point where the river is navigable for steamboats, at all stages of the water. The whole length of the canal, including the

Fox river feeder and the Chicago river, is 105 miles; and the estimated cost, eight millions six hundred and fifty thousand dollars. The expense is to be defrayed mainly from the sales of each alternate section of land along the line of the canal, and two miles in width, which the United States have given for this purpose. The whole line of the canal is under contract, and a portion of it completed. When done, it is supposed that merchandise can be transported from New York, via the Hudson and Erie canal, and the lakes, and be delivered by this canal, to St. Louis, in sixteen days.

In the second division of improvements, the State has appropriated 100,000 dollars to improve the Great Wabash, in conjunction with Indiana—one hundred thousand to the Illinois river—one hundred thousand to the Rock river—fifty thousand to Kaskaskia river—fifty thousand to the Little Wabash—two hundred and fifty thousand on the mail route from Vincennes to St. Louis—and three millions five hundred thousand dollars for a railroad through the centre of the State, from near the junction of the Ohio and Mississippi, to Galena.

A southern cross railroad, from Alton to Mount Carmel, one from Alton to Shawneetown, and another from Belleville,to intersect the Alton road, to Mount Carmel—for all these the State has appropriated 1,700,000 dollars.

A northern cross railroad, from Quincy, on the Mississippi, is to go through Jacksonville, Springfield, (which is to be the capital of the State in 1840,) Decatur, Danville, and in the direction of La Fayette, in Indiana, uniting with the great works of internal improvement in that young but thrifty State—1,850,000 dollars are appropriated for this road.

A railroad from Alton to Hillsborough, Charleston and Paris, to the State line, towards Terre Haute, to unite again with the Indiana improvements—1,250,000 dollars are appropriated for this work.

Seven hundred thousand dollars are appropriated for a railroad from Peoria to Warsaw, at the foot of the Des Moines rapids, on the Mississippi.

Three hundred and fifty thousand dollars for a railroad from Bloomington to Mackinaw, and thence in two branches to the Illinois river—one through Tremont to Pekin—the other to Peoria.

Besides these State works, there are several canals and railroads undertaken by private companies, one from Naples to Jacksonville, now under contract, and partly built—another from Jacksonville to Augusta, on the Illinois river—another from Chicago, twelve miles, to Des Plaines, and designed to be continued to Galena—another from opposite to St. Louis to the coal mines in St. Clair county.

These gigantic works would startle the citizens of the east; but any judicious person, in examining the nature and extent of this great State, would say that they evince great energy and sagacity. This State is large enough to form eight States of the size of Massachusetts; the country, generally, is level, and remarkably favorable for the construction of railroads; and, during a considerable portion of the year, the common roads are almost impassable. The produce of the soil will be nearly doubled in value, for large districts of country, by these works, while every article of necessity or luxury procured from abroad will come at a diminished cost. The benefits accruing to the citizens, and of course to the State, from these two sources alone, will be more than sufficient to pay for the outlay, if there were not a farthing of direct income derived from the investment.

It will be but a few years before one or more railroads will be extended from the eastern termini of these, through Indiana and Ohio, to Lake Erie. When this shall have been done, the people living on the Mississippi, in Missouri, and along this State, will be able to reach New York and Boston, if the Great Western road is built to Albany, in five days, and avoid the tedious and dangerous route over the Alleghany range. If you will cast your eye over the map of the United States, you will find that the most direct route from this quarter to Boston and New York, is by the way of Lake Erie. Massachusetts should

not hesitate, and she will not, if she consult her own interest, to complete her road to Albany, at whatever cost it may require. With a little enterprise, she may secure the direct custom of these vast regions; regions soon to be as well peopled as they are vast—abounding in mineral resources, and blessed with a soil of unrivalled fertility.

The government and the citizens of Massachusetts have not studied their true interests. They have sought their customers—the consumers of their foreign and domestic goods—through circuitous channels; they have helped to build up New York, and Philadelphia, and Baltimore, and New Orleans, by commissions, that they might have retained at home. Massachusetts has the largest share of the trade to India and China, to the Baltic and the Levant, she has a fishery worth ten millions of dollars a year—a manufacturing industry worth sixty or seventy millions annually, and yet she has little or no direct communication with those who consume the surplus produce of her commerce and her labor. Her banks are greatly in fault on this point; they, in a measure, compel the manufacturer and merchant to send his goods to a distant city, by refusing to discount accommodation paper on a pledge of goods, but discounting drafts, because they can get a higher rate of interest under the term *exchange*. This policy ought to be changed, either by the voluntary action of the banks, or by legislative interposition, authorizing a higher rate of interest on home notes, than on bills of exchange.

If Massachusetts will but be true to her own interests, and take suitable measures to secure the direct trade of those who now consume the products of her industry, she may have a city that shall rival in size and opulence, the proudest in the Union.

[To Mr.

PROCEEDINGS

OF THE

WESTERN RAIL-ROAD CORPORATION,

JANUARY 27, 1841;

INCLUDING AN

ADDRESS TO THE PEOPLE

OF THE

COMMONWEALTH OF MASSACHUSETTS,

ON THE APPLICATION FOR

AN ADDITIONAL LOAN

OF THE

STATE CREDIT.

Boston:
DUTTON AND WENTWORTH, PRINTERS.
.....
1841.

WESTERN RAIL-ROAD CORPORATION.

At a special meeting of the Western Rail-road Corporation, held in Boston, January 27, 1841, and very numerously attended, from all parts of the Commonwealth,

Ordered unanimously, That the President and Directors of the Western Rail-road be, and they are hereby required, and enjoined to apply to the Legislature of this Commonwealth, now in Session, for a Loan of the credit of the State, to the Western Rail-road Corporation, for One Million of Dollars, by a State Stock, having thirty years to run, payable to bearer, with Warrants for the Interest at 5 per cent. per annum, payable semi-annually ;—which may be expressed in the Money of Great Britain, making the Principal and Interest payable in London.

Ordered unanimously, That a Committee of sixty-five be appointed to aid the President and Directors, in their application to the Legislature for a loan of the credit of the State, as expressed in the preceding vote ; with power to enlarge their number.

Ordered unanimously, That the following persons compose said Committee.

William Savage, *Chairman.*	Gideon Barstow, *Salem*,
Joseph T. Adams,	Wm. G. Bates, *Westfield*,
Benjamin Adams,	S. A. Bemis,
George W. Bond,	Edward Cruft, Jr.
Amos Binney,	Thomas B. Curtis,
James Boyd,	Stephen A. Chase,
Benj. Butman, *Worcester*,	E. Copeland, Jr.
Richard W. Bayley,	P. P. F. Degrand,

George Darracott,
Elias Hasket Derby,
John Dickinson,
H. A. S. Dearborn,
Nath'l H. Emmons,
William Fettyplace,
Robert Farley,
Chas. Grennell, *N. Bedford*,
Addison Gilmore,
Charles G. Greene,
Nath'l Hammond,
Mark Healey,
George S. Hillard,
David Henshaw,
Richard Haughton,
Doct. Wm. Ingalls,
Francis Jackson,
George H. Kuhn,
Abraham T. Lowe,
S. S. Littlehale,
Thomas J. Lobdell,
Edward P. Merriam,
James K. Mills,
Michael Mellen,
W. W. Parrott,
Edward D. Peters,
George Pratt,
Lemuel Pomeroy, *Pittsfield*,
Charles A. Read,
Henry Rice,
Julius Rockwell, *Pittsfield*,
Luther Robinson,
Stephen O.Russell, *Springfield*.
Caleb Rice, *West Springfield*,
Edward H. Robbins,
B. T. Reed,
Thomas R. Sewall,
Bodwell Sargent,
David A. Simmons,
Charles Stearns, *Springfield*,
James Savage,
Wm. Thomas,
Seth J. Thomas,
John E. Thayer,
Jno. W. Treadwell, *Salem*,
Newell A. Thompson,
Charles Wilkins,
Charles A. Welles,
Wm. F. Weld.

P. P. F. Degrand submitted the following draft of an Address to the people of the Commonwealth of Massachusetts; and this Address was Read and unanimously adopted.

ADDRESS

To the People of the Commonwealth of Massachusetts:

BOSTON, 27th Jan. 1841.

FELLOW CITIZENS,

The time has at length arrived, when we can safely predict the accomplishment, at no distant day, of the great purpose of Massachusetts, THE COMPLETION OF A CHEAP, EASY AND RAPID CHANNEL OF COMMUNICATION WITH THE GREAT WEST;—of a channel of communication uninterrupted by the severity of winter, or by the storms of the seas or of war;—of a channel of communication, which will place, within our daily reach, the interchange of friendly intercourse, with our Fellow Citizens, family friends and relatives in the West—and the interchange of the Products of our Fisheries, of our Commerce, of our Manufactures, and of all the fruits of our never-ceasing, never-tiring Yankee industry, exerted not only at home, but in all Countries and in all climes;—aye, the interchange of all these Products, for the rich Harvests, brought to the Hudson, by the 25,000 Miles of Canals, Rail-Roads, Inland Seas and Great Rivers of our boundless West,—PRESENTING, FOR OUR USE, AN INLAND STEAM-COMMUNICATION, EXCEEDING, IN LENGTH, THE CIRCUMFERENCE OF THE GLOBE.

FELLOW CITIZENS,

The liberal Proceedings of our enlightened Legislators have enabled us so far to advance the Work, as to secure (with but

little more aid,) the completion of the Western Rail-Road, to the Line of the State, within the present year:—*And a Contract of Transportation, very fortunately made, with the Albany and West Stockbridge Rail-Road Company, and with the City of Albany*, in the true enlightened Spirit of mutual interest, HAS PLACED, IN OUR OWN HANDS, THE KEY OF THE WESTERN RAIL-ROAD,—by securing to us the control of the construction and management of the 38 Miles of Rail-Road, from the Line of our State to the very mouth of the Erie and Champlain Canals;—thus giving us possession of the long-sought Prize.

Of these 38 Miles, between Albany and West Stockbridge, —the 23 Miles, from Albany to Groats, are already under contract, and will be vigorously prosecuted, to completion, with a Grade, not exceeding 40 feet to the Mile, and in a manner worthy of the character of the Western Rail-Road, and of the People of Massachusetts. To the 15 Miles, between Groats and West Stockbridge, it is indispensable to impart a like good character; so that the whole extent, from Worcester to Albany, may present a Rail-Road, as free from accidents and from repairs, as the nature of the Country we traverse will permit; —thus securing the great object in view, viz.—*The Carrying of Passengers and of Freight, safely and at a very low Rate, with the greatest Net Profit, for the Western Rail-road.*

Fellow Citizens,

To grapple with this great object, and to obtain the extra number of Locomotives and of Passenger and Freight Cars, which the lengthened Road, and the press of business, attracted to it, will require,—it becomes necessary to have an additional Million of Dollars, over and beyond the amount to be furnished by the Credit of the City of Albany.

It is now proposed that this Million be raised by a Loan of the Credit of our State, taking care to have suitable provisions to secure the Loan and to create a Sinking Fund, to pay it off:—

and it is this proposition, which is now respectfully submitted to your consideration.—Is it, or is it not, for the Public interest, that it should be adopted?—Will the Public Welfare be advanced, by an earlier completion of this Great Work?—Will it be advanced, by doing the work with a master-hand?—Is it or is it not best, *to save, by an earlier completion*, ONE THOUSAND DOLLARS Interest on past Expenditures, FOR EVERY DAY *that we thus shorten the time for its completion?*—Is it or is it not best, for Massachusetts to avail, as quickly as practicable, of our present favoring tide, while other Atlantic States have not yet emerged from their pecuniary embarrassments?—Is it or is it not best, thus to relieve the Patriotic Citizens who, for the Public Good, first shouldered this Great State Work?—and to leave the required Capital, in Private hands, to meet the coming tide of Business?—Is it or is it not best, to avail of the present low price of Rail-Road Iron and of Labor;—aye *of Labor*, which, when thus employed, *in time of need*, is not only a creation of wealth for the State, but is also an act of benevolence of the purest and most enlightened cast?—These are questions, which present themselves to the mind of every intelligent man—and to which the practical good sense of a Business People will give an easy solution.

FELLOW CITIZENS,

To stop our Rail-Road, at West Stockbridge, in a morass, never was and never could be the purpose of our Great State. It was the mouth of the Erie Canal, which we sought and nothing short of it. It was for this, that we did start. It was for this, that we did move onward:—and our settled purpose was to attain this great boon, *in the shortest possible time and without any needless waste of the Interest-Money*, SO FREQUENTLY FOOLED AWAY, BY NEEDLESS DELAY, IN COMPLETING A GREAT WORK. Neither was it the purpose of our Great State to furnish this Great thoroughfare with Cars, Locomotives and Depots, stinted in size or stinted in number;—or with a narrow.

dangerous pass, through the deep Cuts and on the high Embankments;—or with an insecure Bridge, across Connecticut River,—or over the Mountain Torrents. These Great, these indispensable objects were to be *properly* attended to, at whatever cost, which might arise from any unforeseen, or at first unseen, difficulties;—or which might result, from the greater knowledge, daily becoming more and more evident, of the coming flood of business, from the Great and rapidly increasing West. And it is indeed fortunate for the Republic, that science, skill and forecast fearlessly guard, on our road, against all difficulties, as soon as known,—and *candidly* present, as fast as discovered, all the wants of the Corporation, to the enlightened Representatives of an enlightened People;—*and present these wants, in ample season, to receive, at their hands, the needful aid;—and thereby, carefully and providently, guard, against throwing away large masses of Money, by having to suspend the Work,*—or by *needless Loss* of Interest *on previous Expenditures*,—which Expenditures, cannot be made to bring in an Income, until the Road is brought, into actual use.

Fellow Citizens,

In addition to the amount, to be furnished by the City of Albany and to secure which its own investment will form its representative value,—the amount expended, on the Western Rail-road, as far as Albany (including the $1,000,000 now applied for) will be - - - - - - $5,500,000
of which the Stockholders will have furnished 1,200,000

and the credit of the State - - - $4,300,000

It will, therefore, be, *in total*, a Loan of the credit of the State, for - - - - - - - $4,300,000
upon a Property, which cost - - - 5,500,000
In other words, it will be a Loan of 78 *per cent. upon the Stock of a Rail-road, which is marked out by the impress of*

the Almighty's hand, AS ONE OF THE GREATEST, IF NOT THE GREATEST, OF ALL THE THOROUGHFARES, IN THE KNOWN WORLD.—*Need we ask, whether such a Loan can be deemed insecure,* when, even now, *our most retired and most cautious Loaners are very glad to avail of every opportunity to lend* 90 *per cent., on the Stock of either the Lowell, the Worcester, or the Eastern Rail-road,*—neither of which Rail-roads can boast of greater, brighter prospects, than the Western Rail-road?

FELLOW CITIZENS,

The Loan of credit, now applied for, being for $1,000,000, would, if distributed upon our 739,000 Inhabitants, be only the Loan (upon undoubted security) of the credit of each Inhabitant, for the trifling sum of $1,36.—Shall we, who dare to break the Mountains asunder, be arrested by such a trifle?

FELLOW CITIZENS,

The State is a Stockholder, in the Western Rail-road, to the amount of one-third of the Stock.—Our proposition then, merely amounts to this: "*that our Senior Partner, to benefit himself, endorse the Note of the firm, taking good collateral security.*"

FELLOW CITIZENS,

Singularly fortunate indeed has been the effect of the Loans of credit, granted by Massachusettts, to the Western Rail-road.—While other States have been nearly crushed, by commercial revulsions, the Money, daily poured out, with no stinted hand and yet in small rills, through the very heart and great artery of our State, has operated, for us, like a healing balm.—Nor is this all.—The Loan of credit of 1838,—by placing at command all the Exchange on London, that was thirsted for,—

came in, at the exact opportune hour, to Protect the Specie in our Banks;—thus enabling them, fearlessly to resume, at an early day, without spreading general ruin, by disastrous curtailments.—The Loan of credit, in 1839, had an equally fortunate and equally wonderful effect.—It operated like a magic wand.—The suspension of Specie-Payments, in Oct. of that year, in Philadelphia and in the vast Region South and West of that City,—hung upon us, in fearful suspense:—foreboding Suspension, by New-York, as well as by Boston.—Each Place needed, at the instant, some great and striking aid, foreign to the common course of trade:—and each Place desired and strove to create the Power of drawing on London and to protect, by thus drawing, the masses of Specie, daily taking their flight. But vain was the attempt, on the part of New-York.—Her Banks, her Citizens lacked the ability to create this Exchange;—or (if they had the ability) lacked the courage to use it.—And New-York was thus thrown, into the sad alternative of prostrating the whole mass of her industrious population, by the most severe curtailments.—Hence, the mass of Debtors were made to pay, *Specie, in name;—in reality, nothing*.—More fortunate was our lot. The Scrip of the State had given, to the Treasurer of the Western Rail-road, a credit in London of the highest order:—and at the most critical moment, he used it, to a large amount,—protecting, by that single step, the Specie in our Banks and thus enabling our Banks to take the community by the hand and to save, from the general wreck, the whole mass of our Business men.—What cause of gratitude this, for the enlightened forecast of the Legislature of 1838 and of 1839!

Fellow Citizens,

Some idea may be formed of the vast Business, accessible to us when we reach Albany, by the following Extract, from the Message of the Governor of the State of New York, on the 5th January, 1841:

"*The Eastern Section of the Erie Canal has, during the last Season, been subjected to a test of its ability. From the opening to the close of navigation, a period of seven months and a half,* THERE WAS AN AVERAGE LOCKAGE, AT EACH LOCK, OF ONE BOAT IN ELEVEN MINUTES."

In other words, if each Train, on the Western Rail-Road, take two Boat-Loads, the Business, accessible to us, from the Erie Canal, is equal to having a Train start, night and day, every 22 Minutes.

FELLOW CITIZENS,

The Valuation of the Real and Personal Property, in the State of New York, (as per Official Documents) was as follows:

1815	. . . .	$281 Millions
1825	(the year the Erie Canal was finished,)	263 "
1835	. . . .	529 "
1838	. . . .	627 "
1839	. . . .	654 "

It will thus be perceived that, in the 10 years, *preceding the completion of the Erie Canal, the valuation decreased* 6 pr ct.
whereas, in the 10 years, *following* said completion,
the valuation *increased* . . . . 100 pr ct.

It will also be perceived that, during the 14 years, between 1825 and 1839, the wealth of the State was *increased* 391 Millions of Dollars, *which is 55 times the original cost of the Erie Canal, when completed in* 1825.

Does not this show the wonderful effects of Internal Improvements, IN CREATING WEALTH?

FELLOW CITIZENS,

In 1815, the *Valuation* of the Real and Personal Property, in the *State of New-York*, was $281 Millions.

In 1825, it was . . . . . 263 Millions.

In 1839, the *Valuation* of the Real and Personal Property, in the *State of Massachusetts*, (as pr Report of Valuation Committee, dated 5 Jan'y, 1841,) was . . . . . 300 Millions.

Are we not then, as a State, much better able to shoulder our Great State Work, "the Western Rail-Road,"—than New-York was, from 1817 to 1825, to construct her own Great State Works, "the Erie and Champlain Canals?"

FELLOW CITIZENS,

Judging from the effects of these New-York Great Works, in nearly doubling the Wealth of that State, in 10 years,—may we not indulge the confident hope, that the Western Rail-Road will add something like 300 Millions of Dollars, to the Wealth of Massachusetts, within 10 years after its completion to Albany?

FELLOW CITIZENS,

The Erie Canal, finished only 16 years since, *has paid for itself;* has, for several years, *furnished the means of dispensing with the State Tax; and even has given a large Surplus beyond this.* The very last year, it paid, into the Treasury of the State, more than One Million of Dollars Net Money.

The State of Massachusetts is the Owner of $\frac{1}{3}$ of the Western Rail-Road and has the option of purchasing the other $\frac{2}{3}$ at the Cost and 7 pr ct. Interest per annum.

It requires, therefore, no prophetic ken to foretell, that THE WESTERN RAIL-ROAD, *which is simply the continuation of the Erie Canal, will inevitably lead to a result, equally brilliant, for the Treasury of the State and* WILL, AFTER A FEW SHORT YEARS, FOR EVER FURNISH ABUNDANT MEANS TO PAY ALL OUR STATE EXPENDITURES.

Fellow Citizens,

The Table, herewith presented, is an index of a like result, known to exist on other Rail-Roads, both in Europe and in this Country:—and *clearly shows the unerringly onward march of the Net Revenue of Rail-Roads.* It carries us, by the irresistible force of facts, to the conclusion that, whatever may be predicted, by the most sanguine man, of the success of any Rail-Road, on any Great Thoroughfare, will be outstripped,—far outstripped,—by reality.

Is it not then beyond all doubt, that the security now proposed, for the Loan of the Credit of the State, presents the most unquestionable solidity: AND THAT THIS CREDIT WILL PROMOTE THE GENERAL WELFARE OF THE STATE, IN A MANNER SO STRIKING, AS TO ENTITLE THE PRESENT GENERATION, TO THE EVERLASTING GRATITUDE OF POSTERITY?

P. T. O.

TABLE,

INDICATIVE OF THE ONWARD PROGRESS OF THE REVENUE OF RAIL-ROADS.

Boston and Lowell Rail-Road.

Cost, as estimated in 1831, .	$600,000
Actual cost	$1,800,000
Net Revenue, per ann., *as estimated* in 1831, ...	$36,000

Actual Net Revenue, from all sources:

For 5 months of 1835, . .	$45,529
" the year 1836, . .	89,798
" " 1837, . .	102,261
" " 1838, . .	116,180
" " 1839, . .	149,068

Gross Revenue from Freight.

For 5 months of 1835, . .	$688
" the year 1836, . .	39,450
" " 1837, . .	66,456
" " 1838, . .	79,719
" " 1839, . .	105,182

Taunton Branch Rail-Road.

Gross Revenue.	Passengers.	Freight.	Total.
1837,	$34,480	$10,879	$45,760
1838,	33,199	14,932	48,132
1839,	40,626	16,684	57,310
1840,	45,875	18,691	64,566

Boston and Worcester Rail-Road.

Opened to Worcester 3d July, 1835.

		From Freight.	Total.
Gross Revenue.	1835,	$23,821	$119,117
" "	1836,	54,392	175,184
" "	1837,	74,163	197,494
" "	1838,	96,251	194,534
" "	1839,	106,251	231,807

Baltimore and Ohio Rail-Road.

	Gross Revenue.
For 1 year ending 30th Sept. 1833,	$195,700
" " " " 1834,	205,400
" " " " 1835,	263,300
" " " " 1836,	281,300
" " " " 1837,	301,300
" " " " 1839,	432,883

Camden and Amboy Rail-Road.

	No. of Passengers.	Tons of Freight.	Net Revenue.
1833,	109,908	6,043	$181,000
1834,	105,418	8,397	233,000
1835,	147,424	10,811	362,000
1836,	103,731	12,508	407,000
1837,	145,461	10,642	372,000
1838,	164,520	11,765	400,000
1839,	181,479	13,520	427,000

LIVERPOOL AND MANCHESTER RAIL-ROAD.

31 *Miles.*

Cost, estimated at, . .	£ stg. 400,000
Actual cost	1,400,000
Market value of the Stock, at which it is Saleable, . .	£ stg. 2,500,000

(N. B. The Price of the Stock has ranged from 80 to 110 per cent. advance, on the Par, as paid in.)

1832,	*Net Revenue,*	. .	£ stg.	60,673
1833,	" "	. .		74,075
1834,	" "	. .		75,038
1835,	" "	. .		83,621
1836,	" "	. .		85,053
1837,	" "	. .		82,910
1838,	" "	. .		102,270
1839,	" "	. .		111,181

Ordered unanimously, That the Treasurer of the Corporation, for the time being, under the orders of the Board of Directors, be authorized to execute, to the Commonwealth, by proper instruments, in the name of the Corporation, such securities as may be necessary for any loan or loans of their Credit, which the Commonwealth of Massachusetts may grant to this Corporation;—and to re-affirm, as to this new loan or loans, the pledge of collateral security therefor, of the Franchise of the Corporation, together with the Road and its appurtenances and income, including all additions made to the same, after such pledges shall be given;—and also to pledge, as additional collateral security therefor, the Contract of Transportation with the Albany and West Stockbridge Rail-Road Company and all the interest of the Western Rail-Road Corporation, in said Albany and West Stockbridge Rail-Road Company, derived to the Western R. R. Corporation, from said Contract of Transportation and from any advances made or to be made, by said Western R. R. Corporation, under said contract of Transportation.

Ordered, That the proceedings of this meeting, including the address now adopted by the Stockholders, be certified by the President and Clerk of the Corporation, and a copy thereof be forwarded, by the Clerk, to the Governor and to the Lieutenant Governor of the Commonwealth, to each Counsellor, Senator, and member of the House of Representatives, and to each Stockholder.

THOMAS B. WALES, *President.*
ELLIS GRAY LORING, *Clerk.*

BRIEF STATEMENT OF FACTS

IN RELATION TO

THE WESTERN RAIL-ROAD,

FEB. 6, 1841.

BRIEF STATEMENT OF FACTS

IN RELATION TO THE

WESTERN RAIL-ROAD,

FEBRUARY 6th, 1841.

CHARTER.

Dated March 15, 1833—to construct a Rail-Road from the Worcester road, through Springfield to the western boundary of the State.

Capital Stock—not less than one, nor more than two millions.

After 10 years from completion, a right in the Legislature to reduce tolls on certain conditions.

After 20 years, Legislature may purchase the road, by paying cost and 10 per cent. net annual income.

No other Rail-Road to be granted from Worcester or Milbury to the county of Hampden, or from Springfield to the county of Berkshire, *within thirty years:* with power to make *branches* from the main road to any places in the towns through which the road passes, or the towns adjoining the same; also to make a branch to the southern boundary of the State, to meet a road from New Haven and Hartford.

In 1835, private individuals made extensive surveys from Worcester to Springfield, and collected statistics of business and freight.

In June, 1835, *books for subscription to the stock were opened in various parts of this State, and in New York, Hudson and Albany. Great efforts were made for several weeks; but little was subscribed.*

In the autumn of 1835, *public meetings were held in Faneuil Hall and other parts of the State*—THE PATRIOTISM OF THE WHOLE COMMUNITY APPEALED TO—EACH TOWN WAS DIVIDED INTO DISTRICTS—COMMITTEES WERE APPOINTED IN EACH, AND PERSONAL APPLICATION MADE TO EVERY CITIZEN.

In December, 1835, *two millions of stock had been subscribed.*

January, 1836, the Corporation was organized, and the stockholders directed an application to the Legislature for aid.

April 4, 1836, the capital stock was increased to three millions, and the Treasurer of the State directed to subscribe for one million of the stock, and to pay the State's share on *each* assessment, when 75 per cent. of the *same assessment* had been paid by individuals; one-third of the Directors to be chosen by the State.

Prior to February, 1838, the Stockholders had been required to pay assessments to the amount of $20 per share of $100 which on $3,000,000 Stock is equal to . . $600,000

By the act of February 21, 1838, the credit of the State was granted, in aid of the Western Rail-Road, for $2,100,000

on condition that the Stockholders should be assessed 300,000

By the act of March 23, 1839, the credit of the State was granted, in further aid of the Western Rail-Road, for $1,200,000

on condition that the Stockholders should lay further assessments, for 300,000

and on condition also that the State should elect 4 Directors, out of the 9 which compose the Board and on condition also that the State should have

the right to take (at any time it so elects) the Road, by paying its cost ;—and by also paying 7 per cent. on said cost, first deducting from said cost the amount of State Scrip, which the State might pay or assume to pay and deducting also any Dividends received by the Stockholders.

In result, then,

the total amount to be paid in by the Stockholders (and which is all paid in, except a trifling amount) is $40 per share on a capital of $3,000,000, say	$1,200,000
and the total amount furnished by the credit of the State, is	3,300,000
and if the State furnish the Loan, now petitioned for, ...	1,000 000
the amount invested, in the Property pledged to the State, will be	$5,500,000
on which the State will have Loaned its credit, in all, for	$4,300,000

In other words, it will be, in effect, the same as loaning 78 per cent. on one of the best built Rail-Roads in the world ;—which Rail-Road is so situated, as to make its triumphant success certain. It is therefore a Loan of the safest character.—A Loan of 90 per cent. on the Stock of the Nashua or New Bedford or Worcester or Lowell or Eastern Rail-Road is readily taken by our most cautious Loaners, *now that these Roads are completed*,—although WHILE IN CONSTRUCTION, such Loans on the Stock of these very Roads WERE DIFFICULT TO BE OBTAINED and although THREE OF THESE VERY ROADS found themselves *under the* NECESSITY OF ASKING AID OF THE STATE, WHILE THE ROADS WERE YET UNFINISHED.—And it is to be remarked that two of these three Rail-Roads, viz. the Nashua and the New Bedford—have already returned the Scrip furnished them by the State, in their time of need.—The Stock of these three Rail-Roads, although now above par, could not, at that time,

have been sold, without great sacrifice.—The aid of the State has thus protected the men of enterprise and of moderate means, from this sacrifice, and has cost no loss to the State.

PROGRESS OF OPERATION.

1st. East of Connecticut River.

A Rail-Road, as good as any in the world, 54½ Miles long, is in full and successful operation.—Cost, with Engines, Cars, Depots and all its equipment $2,016,969 99

2nd. West of Connecticut River.

In case the State grant the additional aid, now petitioned for, the following will unquestionably be the Result:

The Bridge, across Conn. River, will be opened, for use,			in July,	1841,
28	Miles West of the Bridge to Henry's	"	" in April,	"
9	Miles to the Washington Summit	"	" in July	"
2	Miles at the Washington Summit	"	(probably) in Dec.	"
12	Miles from the Summit to Pittsfield	"	for use, in July	"
11⅘	Miles from Pittsfield to the line of the State	"	" in April	"
62⅘	Miles whole distance, from Springfield to West Stockbridge.			

IT WILL THUS BE PERCEIVED THAT (excepting only 2 Miles at the Washington Summit, which are to be passed by Stage) THE CARS WILL RUN, FROM BOSTON TO THE STATE LINE AND THENCE (on the Hudson and Berkshire Rail-Road as it now exists) TO THE HUDSON RIVER:—and THAT THIS WILL BE DONE WITHIN 6 MONTHS FROM THIS DATE (6 Feb'y, 1841,) PROVIDED THE STATE GRANT THE AID NOW PETITIONED FOR.

The Western Rail-Road, as far as the State line, will rank as high as any Rail-Road in Europe or in this Country, in point of solidity, character, and practical utility:—and will cost as little, if not less pr Mile (considering the difficulties to

be encountered) than any other Rail-Road as yet built, of a like excellent character.

COST OF THE WESTERN RAIL-ROAD.

Actual Cost, *East of Connecticut River*		$2,016,969 99
Estimated Cost, *West of Connecticut River*, with its moving apps. which is also to move on the Albany and West Stockbridge Rail-Road,		3,218,056 78
		$5,235,026 77
Funds furnished by the Stock-holders	$1,200,000	
Funds raised by the Credit of the State	3,300,000	
		4,500,000
Funds yet to be provided for		$735,026 77

Albany and West Stockbridge Rail-Road.

This Road is 38 Miles, in continuation of the Western Rail-Road, to Greenbush, opposite Albany.

It is estimated to cost, of a like good character as the Western Rail-Road, without moving apps.	$1,412,804	
Of which the City of Albany will doubtless provide	$1,000,000	
Less—for the Sinking Fund	100,000	
	900,000	
Funds yet to be provided for		512,804
Together, Funds to be provided, for the two Roads,		$1,247,830 77

There will also be wanted further sums, for a Depot at Boston;—for the enlargement of the Depot at Springfield;—and for arrange-

ments, which may be made with the Hudson and Berkshire Rail-Road.

If the State furnish the Loan of their credit, for the amount now petitioned for, viz. $1,000,000 the Stockholders will do their best to furnish the Balance;—and the Stockholders can do this easier, when the Road is (nearly the whole of it) in operation, than they can now.

If the State furnish the proposed aid, the whole of the Albany and West Stockbridge Rail-Road will undoubtedly be opened before May, 1842.

SINKING FUND, FOR THE ROAD IN MASSACHUSETTS.

Judging from past operations, the result of the Sinking Fund, to extinguish the Loans of the Credit of Massachusetts, amounting together (including the Loan now applied for) to $4,300,000, payable in London, in 30 years, will be as follows:

11 per ct. Premium and Exchange on $4,300,000, to be paid to the Sinking Fund, . .	$473,000
This Sum, if placed for 30 years on Interest at 5 per ct. per annum, and reinvested annually, will produce	$2,044,262 04
$43,000, from the Income of the Road annually, for 27 years, to be paid to the Sinking Fund, on Interest at 5 per ct. and reinvested annually, will produce	2,420,634 02
Total Sinking Fund, at the end of 30 years,	$4,464,896 06
which is more than enough to pay off the whole amount of the Scrip issued and to be issued by the State, in aid of the Western Rail-Road, viz.	$4,300,000

SINKING FUND, FOR THE ALBANY AND WEST STOCKBRIDGE RAIL-ROAD.

The $100,000, reserved from the funds furnished by the the City of Albany, together with 1 per ct. per ann. from the income of the Road, will form a Sinking Fund to extinguish the $1,000,000, City of Albany Stock, which bears 6 per ct. Interest, and has, on an average, 30 years to run. This Sinking Fund is to be invested in Loans on Mortgage in the City of Albany, and other Loans of the safest character. Thus far, these investments have (as allowed by law, in the State of New York) been made at 7 pr ct. Interest pr annum :—and no doubt is entertained of obtaining a like rate, on unquestionable security, for the whole of this Sinking Fund.

It will be seen, at a glance, (by analogy with the above calculation, for the Sinking Fund in Massachusetts,) that this Albany Sinking Fund will extinguish the $1,000,000, Albany City Stock, before the expiration of the 30 years.—*And thus will the State of Massachusetts* (if it give the aid now proposed) *find the debts, created in aid of the two Roads, extinguished for its own benefit, by the operation of the two Sinking Funds.*

FUNDS WANTED, BEYOND FORMER ESTIMATES.

Two Results seem to attend almost every Rail-Road :—the one, " Excess of Cost, over the Original Estimate,"—the other, " Still greater Excess of Net Income, beyond the Original Estimate." And there is consequently a Net Revenue, pr annum, on the actual larger cost, greater pr ct. than the Original estimated pr ct. Net Revenue, on the Original estimated Cost. The principal reason of this, is that the Excess of Cost arises mostly from the fact, that as the business is unfolded to our view, we are impelled, by the greater quantity of business, to build a wider road and a better road, with more of Depots,

Cars and Engines, and more of every thing that costs Money; —so as to meet *properly* the coming business.—*This is done precisely for the same plain reason, which impells a farmer to buy more Bbls. to contain his Cider, when he finds the coming Crop to be very large,—even tho', early in the Spring, (before his trees were in blossom) he told all his neighbors, that he had a sufficient number of Cider Barrels on hand.*

On this principle, the Stock of well built and well located Rail-Roads is, when they are finished, sought after as an Investment, altho' these Roads have cost much more, than the Estimate,—as, for instance, the following successful Rail-Roads:

	Original Estimate.	Actual Cost.
Boston and Lowell Rail-Road	$600,000	$1,800,000
Boston and Worcester "	800,000	2,000,000
Taunton Branch "	110,000	262,000
Stockton and Darlington in Great Britain	£stg 75,000	£stg 300,000

The excess of Cost of the Western Rail-Road is precisely from like causes.—As the importance of the vast business of the Road became better and better known to its officers, they were impelled to give to the Road and to all its Bridges, a character of permanency and a width sufficient to guard, even by extra expense, against accidents, against repairs and against the interruption of its business, in after times.—They have no doubt, that this is true economy.

The sum of $735,026 77 wanted to finish the Western Rail-Road in Massachusetts arises from the following IMPROVEMENTS:

Getting a *firm foundation* for the Piers of the Connecticut River Bridge, although the bottom of the River is underlaid by a bed of *quicksand.*

Making all the deep Cuts and high Embankments and almost all the Bridges, sufficiently wide *for two Tracks, instead of one.*

Increased quantity of Engines and Cars, not only to meet the increase of business of the Road in Massachusetts; but also to Stock the 38 Miles of the Albany and West Stockbridge Rail-Road.

Increased Cost of Engineering, by the longer time, which the Increased quantity of Work necessarily consumes.

Increasing the Number of Depots and their Size, so as to accommodate the increase of Business.

Giving to the whole work a better and a more permanent character.

Interest Money,—and Contingencies not easily foreseen, such, for instance, as finding concealed Rock, of more tenacity than the Rock at first visible,—and finding, under the surface, *Solid Rock*, instead of *loose Rock* and sometimes, instead of earth.

Whoever considers that we have to break asunder the continuation of the Alleghany Mountains and to cross more chains than one;—that in 13 Miles of Mountain-Passes, we have 21 Bridges, some of which are 70 feet above the stream;—and that nature had interposed an almost insuperable Barrier, between us and the Great West,—will deem the Cost of the Western Rail-Road, rather below, than above, what might have been expected;—and will be the more convinced of this, when he examines the following cost of various Rail-Roads, viz.

			Cost pr Mile.
Boston and Lowell Rail-Road	25 Miles		$72,000
Boston and Worcester "	44½ "		44,940
Western Railroad, East of the River	54½ "	actual cost	37,000
" " West of the River	62⅘ "	estimated "	51,400
Boston and Providence Rail-Road	44 "	cost	40,500
Eastern " "	53 "	"	55,000
Grand Junction Rail-Road,	82 Miles and using 15 Miles of the Liverpool and Manchester Rail-Road, actual cost of the 82 Miles $9,132,000		111,000
London and Birmingham Rail-Road,	112 Miles, Cost $27,479,000		245,000
Liverpool and Manchester Rail-Road, 31 Miles Cost $6,720,000			217,000

FUNDS WANTED FOR THE CONTRACT OF TRANSPORTATION, WITH THE ALBANY AND WEST STOCKBRIDGE RAIL-ROAD.

The amount is $512,804—BEING FOR AN ENTIRELY NEW OBJECT, WHICH HAS ENTERED INTO NO FORMER ESTIMATE.—BY MAKING THIS ADVANCE, WE DOUBLE THE VALUE OF THE WESTERN RAIL-ROAD, and consequently we double the value of the $\frac{1}{3}$ of it, which is owned by the State, as we also double the value of the other $\frac{2}{3}$, not only as a pledge to the State,—but also in its ultimate fate, which is to place it, at no distant day, in the hands of the State, when the State elects to purchase it at the Cost and 7 pr ct. per annum Interest.

To appreciate the precious gift, which a kind Providence has thus placed in our hands, we need only reflect, on the position of the Owners of the Western Rail-Road and of the People of Massachusetts, in regard to free access to the Erie Canal, —as that position would be, if the Albany and West Stockbridge Rail-Road were in the hands of men, who deemed it for their interest to impose on us an unreasonable toll:—And then, contrast that position, with the ease, facility, safety and economy, with which we shall, by this contract, be enabled to arrive, with all the Products of our industry, to the very mouth of the Erie Canal, and to receive, in return, the Crops of 1,500,000 Square Miles, containing the largest body of the richest land in the known world!

If it cost six times as much, the purchase would still be a very good bargain.—And yet, in point of fact, the Albany and West Stockbridge Rail-Road will, of itself, be very profitable; —and consequently all the advantages accruing from it to the Western Rail-Road, are, in effect, obtained without cost.

ESTIMATED INCOME OF THE RAIL-ROAD FROM WORCESTER TO ALBANY.

Official Documents, submitted to Congress, show that the average Number of Passengers, between Albany and New York, for 8 months in the year, is 3,000 pr day.—Of these, if at $3 each, the Western Rail-Road will command at least 1,000 pr day, and a greater number in winter, say 300,000 pr ann. at $3 each, ... $900,000

Business People will come here, from Albany direct, because we sell what they want, at the cheapest rate and because we buy what they have to sell at the higher rate.

Pleasure Travel will come here in Summer: because Massachusetts is, at that Season of the year, incomparably more agreeable than New York City.

Out of the 500,000 Tons of Goods, valued at $50 and upwards pr Ton, which pass on the Erie Canal, the Western Rail-Road, at an average Freight of $4 pr Ton, will command 167,000 Tons, ... 668,000

Together, for the through Travel and Freight, $1,568,000

Add—for the Way Travel and Freight (which, on the Erie Canal exceeds in amount the through Business,) 784,000

$2,352,000

Deduct—for all Expenses, including Tolls to the Boston and Worcester Rail-Road, . . 852,000

Net Revenue per Annum, ... $1,500,000

To Show that this Revenue is not exaggerated, we need only advert to the Business of the Erie Canal of which the Western Rail-Road is the continuation.—Take, for instance, the following Extracts from the Annual Report of the Canal Commissioners, to the Legislature of New York, 25 Jan'y, 1841:

"During the last Season, 26,987 Boats passed the Lock near Schenectady, being an average of 117 Boats, for each of the 229 days of Navigation, or ONE BOAT EVERY TWELVE MINUTES."

"At the Breach which (for 6 days in May 1839) took place, on "the long level at Frankfort, A CROWD OF BOATS, MORE "THAN 10 MILES IN LENGTH was accumulated and it "was 10 days after the Breach was repaired, before the Navi- "gation could be relieved."

"There were transported on the Ohio Canal, to Cleaveland

"on Lake Erie, in 1839	93,100 Tons.
in 1840	140,166 Tons.
"Increase, in one year, ...	47,066 Tons"

The Rail-Roads under our own eye, fully confirm, by analogy, the above Estimate of Net Revenue for the Western Rail-Road.—Take, for instance, the *Net Revenue* $149,068 of the *Boston and Lowell Rail-Road*, for 1839 and calculate that Revenue in the proportion which 25 Miles (the length of the Lowell Rail-Road) bears to 154 Miles (the length of the Western Rail-Road) and it will give for 154 Miles . $918,259

Then, if you consider that the communication between Massachusets and the Great West will exceed the communication between Boston and Lowell by at least 64 per cent. . . . 581,741

It will give for 154 Miles as Net Revenue per ann., $1,500,000

Take, also for instance, the *Camden and Amboy Rail-Road.* Its *Net Revenue*, for 1839, was $427,286 and that Road being 61 Miles will (in a like proportion) give for 154 Miles (which is the length of the Western Rail-Road) . $1,078,722

Surely, the intercourse, between the Manufacturers, Fishermen, and Importers of Massachusetts, and the Great West, will be

at least 50 per cent. greater, than the intercourse, on a Rail-Road between New York and Philadelphia.

Again, look at Rail-Roads, in England, on Great Thoroughfares.

The *Net Revenue of the Liverpool and Manchester Rail-Road* for 1839, was £ stg. 111,181—equal to $533,699, for its 31 Miles.—This (in proportion to length) will give per annum for 154 Miles. $2,651,130

The Liverpool and Manchester Rail-Road (although it cost $6,720,000 for its 31 Miles) gives 9 per cent. per ann. Dividend. This and some of the other Rail-Roads give the greater Dividends, because part of their cost is raised by Loan at a Rate of interest lower than the Rate of Net Profit.

The *Net Revenue* of the *Grand Junction Rail-Road*, which is 82 Miles and uses 15 Miles of the Liverpool and Manchester Rail-Road, for 1839, was £ stg. 202,486—equal to $971,932, for, say 90 Miles.—This will give per annum, for 154 Miles, ... $1,663,083

The Grand Junction Rail-Road (although it cost $9,132,000 for 82 miles) gives 14 per cent. Dividend per ann.—Its Stock is worth 108 a 112 per cent. advance.

The *London and Birmingham Rail-Road* although it cost $27,479,000 for 112 Miles, divides upwards of 7 per cent. per ann., and its stock was worth in London

Oct. 29, 1840—58 per cent. advance,

and Dec. 29, 1840—72 per cent. advance.

Its *Gross Revenue*, for Passengers only, for 8 months, ending 31 Jan. 1840, was £ stg. 326,852—equal to $1,568,890.

Its Gross Revenue, for a single week, from all sources, was as follows:

say 1 wk. end'g Oct. 10, 1840	£ stg.	15,115	equal to $72,552 for a single week.
1 wk. end'g June 13,	"	"	16,548
1 wk. end'g July 18,	"	"	17,431
1 wk. end'g Aug. 29,	"	"	16,340
1 wk. end'g Nov. 21,	"	"	11,798
1 wk. end'g Dec. 26,	"	"	14,964

PROCEEDINGS

OF THE

WESTERN RAILROAD

CORPORATION.

1843.



PROCEEDINGS

OF THE

WESTERN RAILROAD

CORPORATION.

WITH A

REPORT OF THE COMMITTEE OF INVESTIGATION.

1843.

BOSTON:

PRINTED BY FREEMAN AND BOLLES.

1843.



WESTERN RAILROAD CORPORATION.

STOCKHOLDERS' MEETING.

JANUARY 10, 1842.

Ordered, that the following named gentlemen:

Messrs. James Savage,
Samuel T. Armstrong,
George Pratt,
Peter T. Homer,
A. W. Thaxter, Jr.,
Arthur Pickering,
John Dickinson,
Uriel Crocker,
William Thomas,
Thomas J. Lobdell,
George Darracott,
William Blake, and
Edward Austin

be a committee with all power necessary to investigate the affairs of the Corporation, and to make any suggestions which they may deem useful.

Ordered, that said committee report at an adjourned meeting, [8th February next.]

Ordered, that the committee be paid for their actual expenses.

Ordered, that said committee have power to fill any vacancies in their number.

Ordered, that said committee report the officers, agents, clerks, and other persons in the employment of the corporation, with their respective salaries, pay or emoluments and privileges.

ELLIS GRAY LORING, *Clerk.*

The Committee of Stockholders of the Western Railroad Company, appointed at their meeting on 10th January last, with all powers necessary to investigate the affairs of the Corporation, and to make any suggestions which they may deem useful,

REPORT, in part, that on 13th of same month of January, they held their first meeting, and on the following day had two meetings, at the first of which Messrs. Armstrong, Crocker and Lobdell resigned, and at the second Messrs. William T. Eustis, William Ward and Stephen H. Perkins were, under power to the Committee to fill vacancies in their number, chosen in their places. Messrs. Armstrong and Lobdell had attended the first meeting, when the points of our duty had been conversed upon, but Mr. Crocker had not. By vote, at the first meeting on the second day of our action, each member of our Committee was made a sub-Committee with authority to examine books and papers in the Clerk's office; and at the next meeting on same day a Committee of five, Pratt, Homer, Savage, Eustis and Austin was deputed to inspect the books of the Clerk's office, and also to report a plan of proceedings for our investigation. This sub-Committee was to call together the whole body. On Saturday, 21st January, the Committee met, by desire of the sub-Committee, and it was voted, that on Monday afternoon thereafter they would proceed to Springfield, and

that every Director be notified, that he may make representations in writing, or personally attend on that and following days while the Committee remained there. Messrs. Eustis, Pratt, Homer, Pickering, Dickinson, Perkins, Darracott, Blake and Austin attended the investigation at Springfield, and Messrs. Savage, Thaxter, Ward and Thomas could not. On Saturday, 28th January, most of the gentlemen being returned from Springfield, a Report, in part, was received from them, to which some expressed dissent, and it was laid on the table. It was, at this meeting, voted, that a Committee of five, Thomas, Thaxter, Pickering, Perkins and Darracott should go over the road, to investigate the duties at each depôt, and report on the buildings, accommodations, and prospects of the road. Another Committee of five, Savage, Pratt, Homer, Thaxter and Austin, was directed to examine the Treasurer's accounts and report. At this meeting a report on the Books and Records of the Clerk's office was made and accepted, as on file. At the same meeting a communication from P. P. F. Degrand, Esq. requesting the Committee to appoint some afternoon to make themselves acquainted with the history of his claim, was received and considered, but it did not seem to the Committee to be within their duty, because from the Records it was not apparent, that any specific claim was made. On Saturday, 4th of February, meetings of the Committee were held in the forenoon and afternoon, a parcel of documents was, at the first, communicated from the President, and it was voted, that the Directors be desired to attend on Monday afternoon following, as also Messrs. Barnes, Gray and Eddy, officers of the Company. At the second meeting, a Report, signed by Pickering and Homer, a minority of the gentlemen, who made investigation at Springfield, was offered, and further parcels of documents from the President were submitted. The meeting on Mon-

day, 6th February, was attended by Messrs. Bliss, Degrand, Derby, Jackson and Low, Directors. Mr. Perkins, one of the Committee, submitted a letter from himself to William Parker, Esq. Superintendent of the Worcester Railroad, with his reply. It was voted to proceed now to investigate the character, quality and usefulness of the Engines now in use upon the Western Railroad, and so the gentlemen were occupied until past eleven o'clock in part of the examination of Mr. Barnes, Chief Engineer, Mr. Winans, constructor of some of the Engines, Mr. Henry Gray, master Mechanic at Springfield, Mr. Allen, master Mechanic at Greenbush, and Mr. Eddy, machinist at Springfield. The Committee adjourned to same place at 3 P. M. on the next day, when several documents were put in, a large one, among others, showing comparison of several Engines on various roads, the miles run, repairs, &c. &c. Mr. Whitcomb conductor of a freight train, and Mr. Young, an engine-man, were examined, chiefly by Mr. Winans, at whose request they were brought. Mr. Allen was also again examined at two several times. Mr. Derby desiring to ask some questions of Mr. Barnes, and Mr. Bliss requesting a hearing for Mr. Jackson relative to the Winans contract, the Chairman saying it would be impossible to make report, except for forms sake, at stockholders' annual meeting, nor for many days thereafter, of result of full investigation to be had, it was agreed to adjourn to Wednesday morning at nine o'clock. After the adjournment Mr. Bliss handed a communication for the Committee relative to appointment of agent to purchase wood. Before adjournment a voluminous statement of six days comparison between two Engines, the Albany and Rhode Island, was handed in by Mr. Barnes.

At the meeting on Wednesday morning, it was, on motion of Mr. Ward, Voted, that the documentary information

obtained by the Committee being too large to act upon before the general meeting of the Stockholders this afternoon, the Committee report the foregoing, and ask for further time to report in detail, and that as regards the engines in particular, the Committee consider that the time has not yet arrived to test fully their efficiency, and they, as yet, express no opinion upon the subject.

Respectfully submitted,

JAS. SAVAGE, *per order.*

February 8, 1843.

It is understood, that neither of the Committees, that to go over the road to investigate, &c. and that to examine the Treasurer's accounts, have yet begun to act in performance of their duties. JAS. SAVAGE.

FEBRUARY 8, 1843.

Read, and recommitted; with instructions to report further, at an adjourned meeting of the corporation.

ELLIS GRAY LORING, *Clerk.*

The committee to investigate the affairs of the Western Railroad, to whom their report, made on 8th ultimo, was recommitted, with instructions to report further, and authority to cause the report they may make, to be printed for circulation among, the stockholders, having, with as much diligence as was within their power, attended to the duty assigned them, respectfully

REPORT:

That some delay was caused in their investigations by the circumstance, of similar investigations going on at the State House by the committee of the two branches of the

General Court, at the same time, for a fortnight, by which the attendance of the treasurer and clerk, as also of the president and other directors was necessarily withdrawn, and the documents, that were very voluminous, (which we had before obtained from the clerk and other officers of the corporation) were often borrowed by those officers for several days to furnish assistance to the legislative committee; that further delay unavoidably arose in the action of a sub-committee, appointed eleven days before our former report, to go over the road for the objects of investigating the duties to be performed by our agents at each depôt, as also to examine the buildings and accommodations on the whole line, and to report, also, on the prospects of the road. Such a succession of snows and thaws had intervened, that, after the failure of two different appointments of a day on which to leave Boston, the committee could not begin until the afternoon of the 21st of February.

We have not supposed that any intimation about candidates for the next board of directors would be expected from their committee by the stockholders. Whether they desire a totally new list, or would retain all or any part of the last board, who do not decline reëlection, they are competent to select without assistance from us; nor would an approach to unanimity among our constituents on that point be expected from our advice, when a disagreement might probably be looked for in the committee itself. Perhaps a diversity of views at such a board, having the oversight of so vast concerns, may be a real advantage, and that a single member, much less the whole board can hardly be chosen, who is always prepared in March to determine how he will act, in various circumstances, when August or December arrives.

Whatever may be the policy of the stockholders, however, in selecting directors, the committee felt no disposition to

enter upon that subject at all; and our constituents will determine, whether in the committee the presence of gentlemen having previous preferences for one or another set of candidates, being perhaps, nearly equally divided, while a large part, if not a majority, had formed no such preference, has not led to a more full inquiry, if not more satisfactory result, than if our composition had been different. Our attention has been kept more alive to some subjects, and directed to more, it may be to too many, by this advantage.

Disagreement at our board of directors, extending, perhaps, too far on one or two matters, had been, it may be, either known, or suspected by the body of the stockholders before the meeting at which this committee was appointed. But we are happy to inform our constituents, that in 1842, there was not more, perhaps less, as one of our own directors said, than in his former experience. Still, as the letter of a director, dated 4th January last, declining a reëlection, that was read to the stockholders at the special meeting, was very impressive, the committee, selected at that meeting, must naturally be presumed to pay great regard to it in their investigations. Part, at least, of our duty seemed to be distinctly set forth in these passages: "On leaving the board, I feel it my duty to express to you the conviction founded upon my past experience, that your prospects of future dividends depend upon your placing at the helm gentlemen who will unite in reducing salaries, dismissing supernumeraries, avoiding large and rash investments in engines of new patterns, and who will make themselves acquainted with the best mode of running your road."

"Born upon the line of your railroad, a frequent visiter to it for many years, and intimately acquainted with the views and habits of those who pass over it, I would also express my belief, that your passenger traffic will never equal your expectations until you adopt a low rate of charges."

First in these objects of regard, is, therefore, the election of "gentlemen who will unite in reducing salaries," and we have patiently investigated the acts of the directors as shown in their records, though it is, of course, to be expected that any board of directors in future, must distinguish between duties of some salary officers *before* and *after* the finishing of our road. We begin with the year 1840, before which we seem not to be expected to go, as the stockholders have report of 12th March of that year, by a most assiduous committee (on which were two gentlemen, who have since been directors all the time, including the gentleman, whose letter abovesaid, indicates our course of inquiry, and a third director for the two last years,) expressing satisfaction with all the salaries, and explaining the propriety of them respectively. The election in 1840, made after the investigation, gives more light therefore, on this particular subject, than would be expected from us.

We find all the directors present at the first meeting, 27th March, when the compensation of the treasurer, moved by one of the Commonwealth's directors, was fixed at $1500, exclusive of clerk hire and all other expenses; the vote being unanimous, except that the treasurer, who was then a director, and soon resigned, (as required by the Statute, relative to officers of railroads to which the credit of the state had been loaned, passed four days before,) did not vote on that question. On the compensation to the clerk, all voted affirmatively. One of the stockholders' directors moved "for agent $3500, in full for services and all expenses, except when out of Commonwealth or in Boston, which should be additional," and the vote was unanimous, the names in each case being recorded. On the president's salary, one of the Commonwealth's directors moved for $2000, and the vote was unanimous, the gentleman, who was thereafter elected president, being the only member of the board absent. But at a previous meeting, on same day, there had

been a disagreement on the amount, all the Commonwealth directors being in favor of a less sum, and all the stockholders' directors in favor of the sum adopted, which had been the allowance, also, the former year.

In 1841, at the first meeting of the directors to organize the board, 23d March, all being present, except one of the Commonwealth's directors, a committee of two of the Commonwealth's and one of the stockholders' directors was ordered to consider and report on the salaries of officers of the corporation. This committee reported on the 8th July, when all the members on the part of the Commonwealth, and three of those for the stockholders, were present; and the report was accepted without dissent. On the same day, all the same directors being present, with two officers of our corporation, not eligible as directors, acting as executive committee of the Albany and West Stockbridge Railroad, the compensations, $4000 to treasurer, with additional allowance of $2000 for clerk hire, office rent, &c., $4000 to agent, and $1000 to clerk and solicitor, without objection, without amendment, applying thus to the two *conjoint* corporations, were adopted. To the president of this corporation, by the first report, the compensation was fixed at $1000.

The director, who declines reëlection, was present at the meeting in 1840, and absent at the meeting in 1841, when those salaries were agreed upon with such unanimity. It may therefore be inferred, that, up to 1842, when the road was nearly finished, no opportunity was afforded for gentlemen to unite in reducing salaries.

The meeting on first March, 1842, was attended by all the directors, when the committee, consisting of three of the Commonwealth's and two of the stockholders' directors, being a majority of the board, who had been appointed the day previous at the organization meeting, which all the directors attended, to consider and report upon the duties and

salaries of the officers, made report, in substance, as hereunder:

For the president $3000, and that his expenses while engaged in the business of the road in Boston or out of the Commonwealth be borne by the corporation.

For engineer and superintendent, . . $5000.
For treasurer, ... $4000.
For clerk and solicitor, ... $750.

They also reported on the subject, referred to them the former day, of the general organization, upon which a committee of the preceding board of directors, three on the part of the state and two on the part of the stockholders, appointed 29th January preceding, had made report on 9th February after, that it was expedient to combine the office or duty of agent with that of president, who should give his whole time to the business of the road. This report had been by the former year's board referred to the new board, with a recommendation of its adoption. The new committee concurred in advising its adoption. It may be agreeable to the stockholders to know, that of these two committees of five in the boards of the two years, only one gentleman, who served in 1841, was on the committee in 1842, so that we have the opinions of nine directors in the two years acting on the committees upon this subject, besides the acquiescence of all their associates in both years. Before, for two years, the agent could not be a director by law.

The whole report was taken up in sections, and all parts accepted without division, excepting the two relating to the president and engineer.

As to the first, one of the directors on the part of the stockholders moved to amend, by striking out the provision relative to expenses, while engaged in Boston or out of the Commonwealth on business of the road, and inserting "said salary to cover all his expenses on the line of the road, including Boston and Albany." Two other of the stockhold-

ers' directors and one of the Commonwealth's united in this proposition, and two of the directors on the part of the stockholders and three of the Commonwealth's voted in the negative.

On the second section the same director on the part of the stockholders who made the former motion, moved a reduction from $5000 to $4000, and three other of the stockholders' directors united in the affirmative, and one of the stockholders' directors, with all the Commonwealth's, voted in the negative. After the failure of a proposition for an intermediate sum by one of the Commonwealth's directors, which was negatived without a division, the report on this part of the subject was adopted, by six in the affirmative, (two of the directors on the part of the stockholders, and all on the part of the Commonwealth) and three directors of the stockholders in the negative.

After acceptance of the report, it was ordered, that $2000 be allowed to treasurer for clerk hire, office rent, and other expenses of his department, without disagreement.

How great regard should be given by the stockholders to an influence against the reduction of the former year's compensation to the engineer and superintendent, from the consideration of its unfavorable effect on the reputation of Major Whistler, to whom we are chiefly indebted for the admirably scientific construction of the great works in our mountain passes and by the banks of the torrents, as it was anticipated, that his services could not be many months longer retained, will be left to their decision. But they should take, in connection, the fact, that his predecessor, Major McNiel, had been withdrawn from our employment by another railroad company at the South, on a salary offered, double that which had been given to him and his successor by us.

Although salaries are paid to many other officers in our service, nearly four hundred persons being generally in our

employ, we do not find any occasion taken of proposing the reduction of any, nor reference to the subject of salaries, except on two occasions, one the 18th May last, when a communication being received from Major Whistler, recommending increase of compensation to conductors of trains, who had served one year, and also to conductors who had served two years, the director, who declines reëlection, moved "that the salaries of the conductors of the passenger trains be raised to $750 per annum." But the motion did not prevail. We presume, from the silence of the records, which mention that the salary was fixed at $700, that yeas and nays were not required.

The other opportunity of uniting to reduce salaries was afforded, when (after resignation of Major Whistler, on first of June last, to accept an invitation for the service of the Russian government, and his duties having been suddenly transferred to the president, and fulfilled until first of October, though the burden was too great to be continued,) on 29th September, the board resolved to choose an engineer of the road, and fixed his compensation at $2500, by vote of two directors on the part of the stockholders, and three of the Commonwealth's, against three directors on the part of the stockholders and one of the Commonwealth's. The board has always followed the course of fixing salary, before proceeding to election. After the election to this office, on motion (by one of the directors on the part of the stockholders who had voted with the majority,) to reduce the compensation to $2000, two of the Commonwealth's directors, who had with him voted for the larger sum, supported the reduction, and thus it was carried by 7 to 2, one of the Commonwealth's and one of the stockholders' directors voting as before in the negative.

Here closes our collection of facts of any importance on the subject of salaries; for propositions, like those of putting conductors of freight trains on equality with conductors of

passenger trains, about which we find either no determination of the Board, or a determination without apparent disagreement, we need not spend time to put on paper. In conclusion, the Committee presume, that the Directors will, as they should, always be better judges than themselves of the proper adjustment of this subject. One day, one week, or one month would not enable a private stockholder to form a satisfactory judgment for himself on the relative duties and compensations of all our officers; and, therefore, we expect the Corporation will excuse us for proposing no other suggestions to the Directors in future, than is hereafter inserted.

All the stockholders may form an opinion on the *policy* in the single case of the President, who has the general agency and superintendence of our Corporation in all its concerns, of fixing compensation, as in 1841, at $4000, without reference to expenses anywhere, or, as in 1840, at $3500, with certain expenses additional; both which courses had been unanimously, as before shown, adopted. When, in 1842, the Board put this compensation at $3000, besides the expenses, at Boston or out of the Commonwealth, they having such a Report by a majority of the Board before them, had the allowance of expenses been stricken out, they would, perhaps, have increased the salary; for if the proposition of the mover of the amendment admits, of necessity, as to us it appears, that expenses *not* on the line of the road, including Boston and Albany, should be additional, (as visits, on our business to New York, Philadelphia, Baltimore or Washington may be indispensable,) it would seem equally necessary to pay for unexpected terms of residence at Boston or Albany. The President is bound by law to attend at Albany the session of the legislature, to render account of the Albany and W. S. Railroad, a most important interest of ours; and a perpetual oversight of the concerns of the road must require his attendance there at other parts of the

year, as well as for the same two great objects in Boston. Could his attention at Boston and Albany be dispensed with, all his time may well be occupied at Springfield, the central point. It may be, that ten days, or fifty may be claimed at Albany, and twenty days, or a hundred at Boston, though these should be distributed through the year; for we know, he can only remain at either, over a single week at once, greatly to our prejudice. The General Court have, this year, required his presence much, and perhaps the Legislature of New York very little. Next year the circumstances may be reversed, and our President be compelled to sustain our interests before the Committee of a New York Legislature, where business does not usually proceed with greater facility than at our State House. Having called on the President for information on this point, we learn, that since 1st March of last year, to 25th February of this, he was absent from home on our business one hundred and sixty-five days, and travelled about eleven thousand five hundred miles. Perhaps in another year the absence may be not half so much, from the change of circumstances.

The question in such a case, is, which is most equitable and expedient, to allow a fixed sum for expenses, or to pay the actual expense? Absolutely, either is equitable, because such is the contract; but if a fixed sum is allowed, an officer may neglect our interest by staying at home, to save money, when he would be doing more service by travelling, and that would certainly be inequitable: or, on the other hand, he may be required by our interest to incur expense, in absence from home, beyond the sum we fixed as that portion of his compensation, and so it would be equally inequitable. Probably in this case, of our highest officer, expediency and equity agree in the result, that just what he spends, and no more, should be paid, and then we must be cautious in election of a man who can be trusted, as decently economical in his travelling charges, no less than scrupulously honest in attending to the outlay of the hun-

dreds of thousands of dollars which we must entrust to him. Is the plan of 1841 better than of 1842 for this petty concern? or should we have saved, or lost, a hundred dollars by the former? are inquiries that we shall never waste time to weigh in coming to this conclusion, — that, whenever the great concerns of this Corporation demand the presence of the president at Boston, Albany, or anywhere else, the stockholders will require his attendance, without regard to the extra expense as coming out of his pocket or theirs.

The next topic of consideration in the letter, founded upon the writer's past experience, is, the uniting of gentlemen at the helm, in "dismissing supernumeraries." On this we are unable to obtain any light from the most proper place in which to look for it. The records are silent about any disagreement, but we have learned by our investigations, that one of the three masters of transportation has been reduced, that roadmasters have been required to lessen the number of their subordinates, and that the pay-roll is frequently examined with a view to this object, and that twenty per cent. of wages in some employments have been cut down. Perhaps justice requires us to refer this part of the advice, however, not so much to past experience of the writer as to anticipation. When the great business depôt of our road at Greenbush is completed, or as other parts of the outlay contemplated in the annual report of almost half a million of dollars for the perfection of the road and its equipment are successively closed, many supernumeraries may be dismissed at various times. Judicious Directors must determine.

A more important topic is the next, the gentlemen to be chosen by you should unite in "avoiding large and rash investments in engines of new patterns." Of course the writer must be understood as presuming that such investments, large and rash, had been made, or that there was

danger they would be. We have given most of our labor and diligence to this subject, because it seemed to be required by our own interest as stockholders, no less than by duty to our constituents. Some of us, having little capacity to understand a question about the action of high mechanical properties brought into complicated combinations in the large machinery, have trusted much to better judges in the Committee and out of it. But on the rashness or prudence of a contract, and the general result of operations, we have labored to get light enough to be soberly guided to an independent conclusion, equally with those who had greater advantages.

Nine of this committee proceeded to Springfield on 23d January, taking copies of all the documents, proposals, and reports about the engines of new patterns, to which, without doubt, reference was had by our resigning director. They spent two days in examinations almost exclusively confined to the subject, reading all the documents, and having assistance of two of the directors on the part of the State and two on the part of the stockholders, who answered all questions and gave all the benefit of their opinions and experience, happily being able to express different views and conclusions on the subject. When adverse results were reported by those gentlemen, except two, who still continued unwilling to come to a final opinion with either side on their respective propositions, before much fuller examination, to aid which very large documents additional had been ordered, and special testimony to be introduced before the full committee, on points much beyond that or those on which the sub-committee had divided at Springfield, more extended investigation followed of necessity. On Monday and Tuesday, 6th and 7th February, most laborious sessions were held, and further, were indispensable, if the report made by us on the eighth should be accepted.

Two days after recommitment of the report, an order was

unanimously passed, requesting the president to direct the engineer, that a full and fair trial be made of the Winans' engines in competition with any of the other freight engines on the road, selecting the best, naming the engines, and giving us notice at least one week previous to the trial, the same to be previous to the 1st of March. It was then voted, that Messrs. Ward, Pickering, Darracott and Dickinson, be a committee to attend to this trial, with authority to invite any gentlemen they please to witness it, and report the result.

At the same meeting, it was unanimously agreed, that those gentlemen who did not attend the investigations at Springfield, with the two who stood indifferent in sentiment or wished further investigation before coming to a close on a single proposition, from either side, of their companions, should take all the documents for examination. Of this the result is embodied in this report.

Much further inquiry was had on the seventeenth and eighteenth, three of the directors on the part of the State, and two of the stockholders' directors assisting, and all the others, who were in Boston, attending, a part of the time, to give any answers that might have been asked, and many more documents were received by the committee in obedience to calls from members.

The stockholders may desire all the information, in our possession, of this most important subject of engines; and they will not, therefore, complain of its tediousness, however the committee may of the labor of obtaining it. On 24th July, 1838, a committee of the president, the agent, and the chief and resident engineers, McNeil and Swift, was directed to examine and report on engines, after visiting any rail-road in the United States. They made report 21st September, which was accepted, advising appointment of a committee to contract for the building of six engines, of ten tons, and two engines of fourteen tons with such manufac-

turers as they may deem most advisable to employ, with the condition that Mr. Whistler, our chief engineer, shall make the drawings and superintend the work of the engines while in progress, and that such engines shall conform to the plan and be manufactured to the perfect satisfaction of the chief engineer. The same gentlemen were made the committee. In April, 1840, application being made in favor of a Philadelphia manufacturer of engines, for a trial of one of his on our road, the same was granted forthwith; and two directors on the part of the stockholders and one of the State's were appointed a committee to superintend the trial. In July of that year, the engineer recommended procuring four more engines of the class then in use, all to be of the same model and construction as those now used, which was referred to the same committee. A communication from the engineer, stating the particulars and results of that trial of the engine with a locomotive, owned by our corporation, called the Suffolk, constructed at Lowell, received on 25th August, was also referred to the same committee, who reported on 29th September of the same year: "that no part of the performance of Mr. Norris's engine, either on the Worcester or Western road indicated that its power was at all superior to that of the Lowell engines as proportioned to the weight resting upon their respective drivers, when at work, and that in the trial at Springfield, the Suffolk gave decided and unequivocal evidence of superiority;" wherefore they recommended, that the engines needed be procured at Lowell. On acceptance of this report, the four directors of the State, with three of those of the stockholders, voted in the affirmative, one in the negative, who had attended said trial, and the director who has resigned was absent. On the same day, the gentleman in the minority moved, that another opportunity be afforded for a trial of William Norris's engine; and on 17th October, he made report, stating the particulars of said trial in August

before, with his reasons for considering the same inconclusive. A memorial from Mr. Norris, on this day, was also submitted, asking permission for a second trial of his engine America, to test her power, speed, and the consumption of fuel, with one of our engines; "also, alleging circumstances tending to show, that the former trial of the America was not properly made." The memorial being committed to one of the directors of the State (who had attended the trial) and the engineers to consider and report, the committee, on 20th November, reported unfavorably to that prayer, and thereupon the board resolved, that they do not deem it expedient to grant the request for another trial.

For the use of the road west of Connecticut river, the agent and engineer having, 8th June, 1841, called the attention of the board to procuring additional passenger and freight engines, on 8th July it was ordered, that proposals of Hinkley & Drury, and of William Norris, to supply them, "be referred to the committee on moving power and the running of the road, with power to authorize the purchase of such engines as they may think requisite." Report on 30th September was made and accepted, "that the committee had closed a contract with Ross Winans, of Baltimore, for seven merchandise engines, and with the proprietors of Locks and Canals for three of the same model and size as those used on our road for passengers, and had also procured two of Gillingham & Winan's coal engines, (these are small) and stating the particulars and results of sundry trials of the engines of Ross Winans." (See Appendix A.)

Here is, no doubt, the origin of the disagreement in the board of directors, which has led to much, if not most of the secret or public excitement on the engines called, in derision, crabs.

It may be desirable to the stockholders to know who constituted this committee on moving power. They were three directors on the part of the State, with the agent and

chief engineer, but no director of the stockholders. More desirable will it be to know, in what manner this committee proceeded. Immediately after the order of 8th July, they issued a circular to different makers of such engines as were designated. Answers from six different parties came in. In the same month, the committee hearing that a very powerful engine was constructed at Baltimore, on a different plan from any heretofore used in this country, sent thither Major Whistler, one of their body, for the purpose of examination. He received very large explanations in writing from Mr. Murray, the superintendent engineer of the Baltimore and Ohio Railroad, (to whom he was referred by the president, Hon. Lewis McLane, for minute facts,) with tables relative to performances, cost of repairs, fuel consumed, &c. of all the engines, twenty-four in number, on the main road, besides four more on the Washington branch, (made by five different constructors,) of which eight were constructed by Gillingham & Winans, and nine by William Norris. The newly invented engine of Winans was not included in said tables, that referred to operations between July, 1834, and March, 1840, because she was not made until March, 1841; but Mr. Murray's statements were exceedingly full upon all her operations for about three months, and Major Whistler witnessed several trials of her qualities. After his return, the committee directed two of their body, directors on the part of the state, to proceed to make farther examination at Baltimore of the new engine, with authority to contract for seven such, if they judged expedient, after full trial and examination. In this duty they proceeded, 6th August, from Boston, and had the benefit of company of Mr. Brownell,* chief machinist of

* He went on, by request of Mr. Whistler, to see if he could make such engines, seasonably, at Lowell; but went on the road at trial of the engine but one day.

Locks and Canals Company at Lowell; and the committee spent several days in examinations and trials of engines, and concluded, from the performance of this engine, called the Maryland, that she will be able to carry over the strong grades of the Western Railroad eighty tons of merchandise six miles an hour, and probably on all other parts of the road one hundred tons twelve miles per hour. The report was made on the way home, 12th August. (See Appendix B.)

Unfortunately, on the same 6th of August, Mr. Norris had reached Boston, and wrote to one of the directors, (who was thus gone that day for Baltimore) regretting his absence would prevent conference about the supply of locomotives, and cautioning him against the purchase of Winans' engines. Equally unfortunate was the fact, that Mr. Winans had also come on to Boston, while these trials were made at the South; so that our responsible committee was acting without the advantage of either of these antagonist constructors, and compelled to form a judgment on the use of their own eyes, with assistance of gentlemen of known experience.

The result was, that a third mission to Baltimore was had, and Major Whistler concluded a contract. On the terms of this contract, objected to as loose and imprudent, it is left to the stockholders to decide, and accordingly it is annexed, marked C. (See Appendix.)

As to the contract itself, the committee believe, but not with unanimity, that reasonable care was taken in examination of the pattern engine, Maryland, and that the purchase was judicious. She was delivered soon after, some months before it was necessary to bring her on. Security for the fulfilment of the contract was given both by Winans, 21st October, for his part of the machines, and the Philadelphia sub-contractors for their part. We are satisfied with the *honorable* fulfilment of the contract by them, though the ninety days' trial is not by them asserted to be closed,

inasmuch as, in the vacation of the road, little freight offering after November before May, opportunity is taken for some alterations, to make the engines more perfect and consistent in all their corresponding parts. Great dissatisfaction had arisen in the president and engineer at the occurrence of disasters, in the breaking of cranks or axles, too small, by near an inch in diameter, to bear the service and strains these engines must be exposed to, besides many other injuries to dependent parts. Much greater than the carrying contemplated by the examining committee has been, many days, exacted from these engines, since the road opened in September last, and sometimes they have performed, sometimes failed in this greater service, as well as sometimes in their ordinary service. Nearly all the freight from Albany to Pittsfield has been brought by four of these engines, all which have, it is said, been burned in some measure in their boilers, owing to the carelessness or want of experience of their engineers; and from Pittsfield towards Boston, partly by the other three Winans' engines, partly by three Lowell engines. The freight this way has been more than five times as much as from east to west, and double the freight has been sent from Albany that was received at Boston, because of supply at intermediate places. So we can judge, in part, as the depôt in Pittsfield is nine hundred and eighty-six feet above that at Greenbush, and the summit this side of Pittsfield is only four hundred and seventy feet above that. But it is hardly worth the time to put single points like this on paper, because a hundred might be needed to justify a perfect conclusion. We therefore request attention to the trial on 22d February, ordered by us, as to the capacity of these machines. (See Appendix K.)

Before September last, all our carriage, both of passengers and freight, was over the Hudson and Berkshire road for fifteen miles, where heavy trains could not run, by rea-

son of the weakness of the rail and corresponding inferiority in every respect to our road. On this part, therefore, a double change occurred at every freight train, the small Winans' engines being used, when the large stopped at either end of the piece of road hired by us. So three engines, of necessity, were employed in carrying a single load from Albany to Pittsfield, and also the reverse.

We have the satisfaction of knowing, that Mr. Winans, at his own expense, makes all alterations applying to principle and adaptation of parts, being present many months; and that payment is not actually made in full, though advances had been, as the progress of the engines at Baltimore and Philadelphia advanced. Sixteen thousand dollars and upwards remained in our hands, when this committee began inquiries, and above ten thousand of the purchase money is yet unpaid. The order of the coming to our road of the several engines is as follows: the Maryland, stored for us at Baltimore after purchase, came on 1st January, 1842; the second, Michigan, 26th January; the third, Ohio, 15th February; the fourth, fifth, sixth and seventh, Illinois, Arkansas, Indiana and Missouri, successively, before the season for abundant freight, 1st April, 1st August, 29th August, and 1st September. Certainly our committee on moving power might have annulled the contract for non-compliance by the constructors in point of time; but they probably wished much to obtain the engines in a reasonable period, and thought it would be injurious to the corporation, rather than the maker, to throw up the contract. (See Appendix D.)

Many more pages we might expend on this subject, having abundant materials, but it would be impossible to use them fully in season for this Report.

We therefore return to the admonitions of the letter to the stockholders, which next recommends as directors gentlemen "who will make themselves acquainted with the best

mode of running your road." In this every one must concur. The Committee on moving power of the year before last did not include our adviser, who had then no more experience than either of its members, and less than several; nor does it necessarily follow that he intends to convey any censure on his associate directors. But this is of little comparative importance to the Corporation. The year 1842, was the first, in which the running of our Road could be tried in its most interesting relations, and we are pleased to find this first work so successful. No other Railroad in our country, probably none in the world, has such high grades in parts of the line as ours; no other employs so large engines as these from Winans. Yet the fact being always kept in view, that transportation of freight is much more expensive, per mile, than that of passengers, our Road has been run, it is evident, proportionably cheaper than any other Road we know of. The ratio of freight income to passenger income is greater on the Western than any other, except the Nashua; while our charge for freight is perhaps lower than any in America. Annexed is a table for the year 1842, of the ten best known Railroads, which on this point is worth study.

Expense.		Miles run.	Exp. pr. mile.	Freight income.	Pass. income.	Fr. less than pass. income.
Nashua	$43,832,58	44,040	cents 99,53	$63,124	$66,305	5 per cent.
Western*	266,619,30	397,295	67,10	226,674	266,446	18½
Lowell	131,012,70	143,607	91,23	122,059	148,042	21¼
Worcester†	168,509,51	241,319	69,82	148,188	186,610	26
Norwich	74,459,76	144,321	51,59	45,419	84,342	85¾
Providence	101,692,10	132,229	76,90	62,123	163,787	162
Maine	79,278,61	152,453	52,	38,443	109,681	185
Taunton	18,065,75	21,904	82,48	18,963	55,711	193
N. Bedford	23,354,87	40,734	57,34	8,920	43,483	387
Eastern	119,039,71	184,127	64,65	16,083	237,023	1373

Well might the New Bedford, or the Eastern, could they obtain a proportion of freight like ours, be content to have

* Including hire of the B. and Hudson engines.

† Excluding $10,000 expense charged to reserve fund.

as moderate increase of expense, without climbing the hills between Albany and Boston. Both the roads nearest to our proportion of freight, as well as the only one above us, are at higher expense.

The last suggestion of the farewell address of our departing friend is of his belief "that your passenger traffic will never equal your expectations until you adopt a low rate of charges." The low rate of passenger fares, in order to obtain custom, is precisely what has been adopted already, as a universal principle, to which nobody in our country or any other could ever object. But what is *low* is a matter of positive or comparative estimate. Positively it is low fare, when the traveller saves money, if he goes by the railroad, (counting time at money's worth, in the reckoning,) and does not beg his way on the other road, whether he goes on foot, horseback, or by any vehicle. Yet the giver of this advice may be presumed to refer to the comparative sense of the word. · On this point we could be very full, but wish to be brief.

Much has been said in our community, of late, about high fares and low fares. Perhaps some of us have imagined, that distinct parties were formed, upon this subject, at our directors' Board. We are happy to find it is not so. No division, by yeas and nays, on the *general* matter, appears in their records. In March last, the rate of fare for *through* passengers was agreed on with unanimity, when every director (except one of the stockholders, *not* him who resigned,) was present, to be five dollars. *Before* opening the road, it had been, by compromise, at $5,50; propositions for five and for six being made. That for the larger sum, being put first, failed by an equal division, and that for the smaller was withdrawn. · On 18th May last, an order was submitted by one of the Stockholders' directors, "that the fare for first class passengers, between Boston and Albany, be fixed at four dollars;" and at a

meeting the week after, discussion was had, and the order still lies on the table. As no division is recorded, and the resigning director was not the mover of the order, we know not his opinion on the matter. On 29th November last, it was ordered, on motion of one of the State's directors, amended, "that the fare of passengers from Boston to Albany and from Albany to Boston, be six dollars, from the 5th day of December until the opening of the navigation of the Hudson to Albany, when the fare shall be five dollars." Of the yeas and nays on this narrow question, we find that three of the State's directors, and two of the Stockholders' were the majority; and three of the Stockholders' and one of the State's the minority. By vote, fare for *way* passengers, while the fare between Boston and Albany remained at six dollars, was then fixed at three cents per mile. This order was moved by another of the State's directors, and all his colleagues voting with him, and the two Stockholders' directors of the former majority, passed by six to three, the same three of our directors, as before, voting in the negative.

Another consideration of some value is, that if high and low be relative terms, in the connexion indicated by our adviser, and we see not how else to regard them, they refer to fares of other railroads more than to our own, in the comparison to be instituted, because we have had less experience. But fares, both for passengers and freight, we all know, are not so low on most railroads, if any, in our country.

Nobody has ever proposed, we think, to put the fares high, *positively*, nor is any one so perverse in a theory as to propose, *positively*, to put them low; since, in either case, the effect must be, to diminish the net income of the road. The true principle, all must admit, is to obtain the largest *net* income. We use the qualification of *net* income, because, to carry five hundred tons or passengers, must be

more profitable, clearly, than to carry a thousand, if the additional payment for the thousand be less than the difference of expense. In carriage of merchandise, it may be much easier to determine the relation, than in that of passengers, because the latter is more a matter of conjecture, before hand; but either requires full trials for a satisfactory determination, and neither passengers nor freight will consult our convenience in the experiment.

Some have thought, a lower rate, at a particular time, would produce more profit than that then established, while some, at that same time, might suppose that a higher than the actual would be the profitable rate. In support of either opinion, would any go so far as to reject the benefit of experience, without which decision must be perilous? What experience shall be followed, in the absence of our own, which heaven makes more instructive than that of others, may be a question on which diversity, more or less, would very naturally arise. The season of the year ought to be very influential in determining fares, and three reasons require attention to it; competition, that may be inactive at one period and strong in another, — the expense of an establishment, increasing or diminishing, according to the Almanac, — and then the attraction of reduction of fare will be powerful in pleasant weather, while, if put at nothing in December, January, February and March, nobody will travel without urgent business. Policy must vary with circumstances. But the circumstances to govern a sagacious director, will not so much be looked for in Belgium, or France, or Austria, as much nearer home.

We deeply regret that all the railroads of New York in the line of travel from Albany to Buffalo, though their average cost, per mile, may not be half equal to ours, have adopted, by a convention of their directors, the rule of charging for their first class cars, four cents per mile, when ours is to be two and a half. They have, however, establish-

ed a slow train of inferior cars at the same rate with our best. Their experience, it may be hoped, will next year lead to a reduction of fares nearer to our standard, if not coming fully down to our level, as may ultimately be expected. Stockholders in their roads, no more than we, it may be conceived, intend to choose directors unable to change their opinions for good reasons, or incompetent to weigh reasons for putting any fare higher or lower. As their experience may satisfy them, that former judicious directors are not easily found, who have not voted different ways on the same proposition under different circumstances, it would be desirable that no list of a board of directors of a railroad should ever be offered at stockholders' elections, on the sole foundation of a disagreement about higher or lower fares.

The committee would prefer to express no opinion on this particular subject, but so far as the subject is connected with the increase or diminution of business of the road, we remember, and hope the directors always will, that the principal, almost the sole, purpose of building this road was to obtain the winter trade when the North River is closed.

With regard to freight, we are happy to observe, that the established rates are even lower, generally, than what the committee of investigation in 1840, recommended; and to hear that a farther reduction on merchandise, from Boston westwardly, is in contemplation to be proposed to the next Board. The attempt to equalize, more than at present, freight upwards and downwards, even if fares between the routes be different, in our opinion of the evil noticed on p. 30, of our directors' annual report, must be attended with favorable results.

Before leaving these inquiries suggested by the letter of the retiring Director, we state, that we have not taken notes from the records of any further disagreement at the Board, than the few slight ones before-mentioned, except two. One was, 27th July last, at the meeting of the Executive Com-

mittee of the Albany Rail Road, all our nine directors being present and no other member, a Stockholders' director moved, "that the Depôt building at Greenbush be laid on a foundation of piles," when a State director moved, that it lie upon the table; and the question was decided by yeas and nays, three of our directors, including the writer of the letter, and two of the State's, made the majority, and two of each of the State's and Stockholders' directors were in the negative. Whether this be a subject on which the excitement of stockholders should be stimulated, we did not inquire, and we heard no expression of private grief about it in our investigations. This is the only instance of a division in that department of our affairs.

The other disagreement we have note of, which we may hope may be equally exempt from ill blood, is on 22d October last, when the retiring director moved this order, "that it is expedient to build a branch Rail Road from Springfield to Cabotville," and two other of our directors supported it, and two of our directors with three of the State's voted in the negative.

We have thus gone over the principal points of investigation, which naturally presented themselves at the meeting, when this Committee was chosen by the Stockholders, and the letter to them, written 4th January, was read.

But a few desultory remarks on topics growing out of our inquiries may be indulged, because connected with our interests very closely.

Decision upon fares, both of freight and passengers, must in the nature of things be influenced by our connexion with the Worcester Rail Road. Happily we have advantageously adjusted with that Corporation our tariff of merchandise transport; and we feel great confidence in the good judgment and liberality of that Board of directors. Yet their liberality will, of necessity, be regulated by judgment of their own interest. We must pay for going over

that road; and as they charge $1, 50 for first-class passengers between Boston and Worcester all the year round, they seemed to themselves liberal in asking only $1, 25 for our passengers. But when we reduced our fare last year from $5, 50 to 5, after long negotiations, they consented to take one dollar, being one fifth, which is less by a fraction than the proportion of length of road. Yet even then, for passengers going to or coming from any depôt this side of Pittsfield, their share continued $1,25. Reduction of fare will increase passengers, certainly, in seven or eight months, that is the productive season, for so few expect corn to ripen in February, that argument need not be extended to the rest of the year. Now let us make a probable supposition, that our through passengers at 5 dollars, the established rate, be equal to 16000, of first class. (Second class are at two thirds price on each road, and 3000 of them are the same as 2000 of the others.) This gives us $80,000, of which we pay Worcester Road 16,000, and retain 64,000. Our *way* passengers probably will be 180,000, of first class, (including the share of second class equalized as before,) and may give us, for their various distances, as much as 90,000 *through* passengers, i. e $450,000, out of which we pay Worcester Road (if we take for simplicity of estimate, the whole, when it may be only something between ¼ and ⅛) for 20,000 one dollar each, and for 160,000 one dollar and a quarter each, equal to $220,000, and retain 230,000, making us in all $294,000 for our passengers, 16,000 *through* and 180,000 *way*, which is a little better than the whole of last year's result, but not above what this year may reasonably be expected. But next assume a reduction of fare to four dollars for first class passengers *through*, and proportionate reduction for *way* passengers, and assume, of course, a great increase in numbers of both, perhaps fifty per cent. for *through*, and thirty per cent. for *way*, will appear at least large enough. Then 24000 *through*

at $4, gives $96,000, of which we pay Worcester road 24,000 and retain 72,000; while of the 234,000 *way* (taking the same proportions, as before, of equal to one half of the number as *through* in fare) we receive $468,000 and pay Worcester road for 26,000, one dollar each, and for the 208,000 one dollar and a quarter each, equal to $286,000 and retain only 182,000 making us in all $254,000 for our passengers, or $40,000 less than the former just estimate. If the assumption be for fare $3, though the number of passengers increase a hundred per cent. the result must be still more disastrous.

What, then, it may be asked, will not reduction of fare give large profit? We answer, sometimes it will, sometimes it will not, and show, in support of the latter result, the application of *assumed*, combined with an *existing* state of things. There is surely a possibility of putting fares too low, as many a fool has proved in the extravagant competitions of our stage coaches. If it be clear, that four dollars will give more than five dollars fare, we should hope the directors of the Worcester Rail Road would see the thing in the same light, and reduce their claim on us, without which we cannot reduce. Information of facts has been communicated from the president of that road on our request.

Some attention has been given by us to the apprehension of evil about the deficiencies of the new freight engines. We know they were not a few, and we hope they are remedied. It is not possible to make up a decided opinion, upon the experience of them in the single year 1842, because the alterations must be proved. Of the great principle in their construction, superior to that of all former engines, we have full evidence, and believe the application will result in a great saving of expense for the freight, the chief object, that led to the creation of our road. Some comparison we can make with confidence. Let us take the expense of running engines on our road in the years 1841

and 1842. In the former, all the engines were of the Lowell manufacture, and the line was almost wholly this side of Connecticut River. In the latter, we have the same Lowell engines, thirteen in number, with two more coming on last March, and the seven large and two small Winans engines, the Lowell (except three freight engines, of which one came on last year, of twenty tons* each,) all weighing fourteen tons each, the large Winans, except the Maryland of nineteen and three fourths, all weighing twenty-two and a half tons each, the small ones, indispensable at the time, but too confined in action on the line to be regarded in this view. Now we may reasonably expect an equal expense, nearly, of the same, Lowell, engines, on the same portions of the road, for the same proportion of merchandise and passengers, the latter year as the former. But stockholders will see, in their annual Reports of the two years, that receipts for passenger carriage increased the latter year 134 per cent., while receipts for freight increased 251 per cent. We surmounted, last year, for the first time, the heavy grades of the Berkshire hills, which require more fuel, and add otherwise to expense, for each mile run, and we may as reasonably expect heavier expense in the aggregate, per mile, for these three elements — increase of proportion of freight above passengers — heavier engines — and higher grades. The Report last year of the operations of 1841, show the miles run 160,106, at expense of $104,806.56, or $65\frac{46}{100}$ cents per mile; and the Report this year of doings in 1842, show 397,295 miles run at expense of $266,619.30, or $67\frac{10}{100}$ cents, an increase of $1\frac{64}{100}$ cents per mile, about $2\frac{1}{2}$ per cent. Even of this small increase, for such harder work, some explanation may easily be found; that part of the expenses are, in 1842, since opening of the road in full, properly charged to the account of transportation, such as en-

* The ton is, by law, established at 2,000 pounds.

gineers, agents and clerks, while the same sort of expenses, in 1841, should partly be, as they were, properly charged to account of construction. So that, judging from the result, it may be concluded, either that the smaller engines, on the easier grades, have performed their work much cheaper last year than the former; or else the heavier engines, on the harder grades, have not performed their work much dearer than the others did. One or the other must be true, and perhaps we may be satisfied with the good judgment and management of our officers, whichever be assumed.

If we turn to table B of our latest Annual Report, we see the items of these expenses of transportation, and separately in tables C, D, E, F, G, and H; but the peculiar misfortunes of these Winans engines have been so exaggerated, as to make us fear, that the head of repairs of engines and cars last year would be very disproportionate to the magnitude of that in the former year. Taking the distance run in 1841, 160,106 miles, and dividing repairs of engines and cars, (Lowell only,) $16,979.24, as shown on p. 17 of last year's report, the quotient is a little above $10\frac{6}{10}$ cents per mile; and in 1842, 397,295 miles into the repairs of engines and cars, (Lowell and Winans') $37,921.56 in tables D and E of this year's report, the quotient is a little below $9\frac{6}{10}$ cents per mile, a saving, instead of loss, of ten per cent. We know that this comparison is not, of itself alone, a just test, because the Lowell engines last year cost much less for repairs than the year before; but we suppose that, with equal improvement in the management of the Winans engines a second year, as the Lowell engines enjoyed in *their* second year, a proportionate diminution of expense for those as for these will ensue. We wish the experiment may be fairly tried. Our engineer and other officers, very naturally, as they told us, had a preference for the Lowell engines, being familiar faces; while the strangers, of a very different pattern and action, made for labor far

more than beauty, had to encounter some slight prejudice, from their novelty, and partly, in opinion of others, from their names. Probably, the stockholders may be as well gratified by success in their service of *crabs*, as if the machines were called *lobsters*, or even dolphins. We do not look for beauty in a freight engine or a mudscow.

Further comparison may be agreeable to our constituents. We have before given a table of proportions of freight and passenger incomes, with miles run, and total expense, on ten Railroads; and now we wish to look at this single item of *repairs of engines and cars, in all*, except the Eastern, of which we can obtain no explanation from their annual report to the Legislature:

	Miles run.	Repair of Cars and Engines.	Ratio of Expense per mile.
Maine	152,453	$8169,42	5,36 cents
Norwich	144,321	9618,38	6,66
Worcester	241,319	19073,31	7,90
Western	397,295	37921,56	9,54
Providence	132,229	13505,90	.10,21
New Bedford	40,734	4418,51	.10,85
Taunton	21,904	2418,63	.11,04
Nashua	44,040	7159,79	.16,26
Lowell	143,607	28816,36	.20,06
Miles	1,317,902	$131,101,86 — average,	9,95 cents.

Conclusions from experience may be, we know, precipitate, if drawn either from partial comparisons, or without allowing for accidental circumstances; and we have brought as many comparisons as we could. But persons who resolve to differ in results, may gratify their love of disagreement, from the same facts. From table K, in the annual report, one may argue, that from March to April, and from April to May, the *increase* of *through* passengers, after opening of the river, arises from the reduction of fare; and another, that from month to month for the same time, the *decrease* of *way* passengers, notwithstanding proportionate reduction, renders

the conclusion hypothetical, yet he ought not to assign the reduction of the fare, or the opening of the North river, as the cause of the *decrease*. One gentleman may think a comparison of January, 1842, with the same month of 1843, decisive against the fare for passengers, which is half a cent a mile higher for first class; while another will say the opening of our Road in that month last year tended much to bring between Albany and Boston a portion of visiters desiring solely to behold the respective cities for the first time, or to see the way, on the experimental trips, while no *such* inducement of course existed this year; and yet another, perhaps in derision, will say the *increase* of fare by one third of a cent a mile made the second class *through* passengers increase, as they did, almost four hundred per cent. It may be guessed, from the same table, that increase of fare from five to six dollars for the first class passengers between Albany and Boston reduced by a full third the number from November to December, when the change occurred; but it may also be guessed, that the diminution was owing to the season of the year, especially as an equal diminution occurred, before the raising of fare, from October to November. An encouraging increase of *way* passengers, at the higher rates, in February and March over January of last year may be one ground of opinion on this subject, though the *through* passengers fell off between January and February one fifth.

Here stockholders may correct an error in their table K. The number of first class passengers *through* should be 843 instead of 1074, for January. The difference 231 consisted of passengers between Albany and New York, taking their course by New Haven, *not* by Norwich. When the clerk at Springfield detected the error, he corrected it only in part, adding, as he should, to the *way* passengers, so given correctly, without subtracting, as he should, the number from the *through* passengers, so given incorrectly.

Second class *through* passengers fell off from May to June, and *way* passengers from April to May and June, yet the fare was the same. Shall we blame the management of the road? or look to change of circumstances?

Between freight and passengers, generally, we all believe there is a close relation, and our confidence in the success of the Road is built much on it; yet from August, every month to November, freight increased and passengers decreased. What then?

We have heard of no disagreement about the extension of accommodation to passengers last December, when our Directors ran the trains more miles than in any other month, except August; yet the passage money taken was less in December than in any other month, except February. What then?

Freight increased ten per cent. this year in February over the same month of last year. Shall we suppose this was owing to the unusual bad snow-storms of this year, that did, no doubt, keep off passengers?

We trust to the good sense of stockholders to draw conclusions for themselves, which we have no time to indicate.

Very willingly would the Committee have attended to any inquiry into the conduct of the President, Treasurer, Directors or other officers of the corporation, and all their subordinates, about which a single stockholder had felt or expressed dissatisfaction, though the subject might not have been found in the Records. But of most such, we could not possibly receive notice. It did not seem expedient to advertise for complaints, though at our earliest meeting such a course was proposed by one of our number. On some matters, of comparatively small importance, we take occasion to observe in conclusion.

A report, rather disingenuous, than false, has been in circulation, that our president, last March, voted on the question of his own salary. So he did; but it was *before* the

choice, when it was his duty, as that of the other directors, to fix it. He had not been in the board for the two preceding years. The director, who made the motion to amend, informed the committee, when inquiring on this subject, (which is explained before in the early part of this report,) that there were three candidates for the presidency in this board of nine members, and that it was very uncertain who would be chosen. Probably it will seem to our constituents, that disingenuousness is a near relation in blood to dishonesty, and may as well sometimes do his dirty work. The intemperance, or the fraud, sometimes chargeable on political partisans, who equivocate, or palter with truth by giving only a half or a quarter of the facts, is not to be encouraged in a corporation with a different constitution from that of the state or nation.

Of a second report, about patronage of connexions by the president, we could speak more confidently from the records. The committee do not, however, find any foundation for complaints of this nature, nor any persons appointed to office whom they have reason to disapprove on the ground of family connexions.

Only two more idle reports can we find time and room to notice. It has by some been thought, that a special appointment of an officer to purchase wood was made, and a salary granted for the service, that had before been performed without expense by the officers at the several depôts, where the supply should be stored. We find, that this service is devolved on a gentleman, who was before an assistant in important concerns of the road, having a regular salary, which is not increased for this addition of his duty. In the opinion of the State's director, who recommended the transfer to this individual, for good reasons, of this most important service, the change will be an annual saving of double the compensation. We, however, suggest to carry this matter still farther, and that the directors appoint, for

this matter of purchase of forty or fifty thousand dollars' worth of fuel per annum, an officer to contract for and oversee, on all the line, the fuel that ought to be stored some months and prepared for use. Probably purchase of oil and cotton waste may be assigned to the same officer. (See on this subject, Appendix, I.)

The last speculation of gossip is, that rooms at the Tremont House for the president were engaged, and paid for, the year round. Of the truth, or falsity of this rumor, every stockholder in Boston, could, of course, easily satisfy himself. The committee would not ask, because we found, that the president was shifted about, as other transient travellers. Probably the mistake of the first or second hand, who caused, perhaps unintentionally, the spread of the story, arose from misunderstanding the effect of the question last March, on allowance of expenses in addition to salary, which we have before explained. Yet this by the third or fourth hand, that caught the ball, is ascribed to one of the directors, and so a false impression is given, which that gentleman, or any other, would disdain to circulate. Similar errors, it may be, are spread about, which it is too much to call malignant, when they are only absurd.

We recommend that separate accounts of the personal expenses, whilst travelling upon the business of the road, chargeable to the corporation, be kept by the president and every director.

We have, at almost the last moment, received a report from our sub-committee appointed to go over the road, examine its general administration, duties of its local officers, &c., &c. Unfortunately, only three could give their attention to this interesting part of our inquiries, and the report is signed by Blake, Dickinson and Pickering. Of the comparative importance of the various stations, and the corresponding responsibility on the agents attached to them, the

amount of observation must be, in a degree, too slight for foundation of opinion in parts of the line. Tables, of much length, of amount of freight collected at each of the thirty-two stations, during the whole year, and of amount of passage money collected at the same in the largest and smallest month's gathering; also an exhibit of amount of freight received from and forwarded to each station, with the number of barrels of flour forwarded from Greenbush, whereby we learn, that our success depends more on administration of transport department there than anywhere else, even Springfield, Worcester, or Boston, making less amount of service for that particular; also copy of a monthly pay roll; also the return required from master of transportation, as to expenditure under his care, showing all the items for running of the road; also the statement for one month relative to ferry carried on by us from Greenbush to Albany; also statement of lands owned by us, in surplus, at various depôts, with estimate, in the opinion of Mr. Child, of their probable value, — we do not think of swelling our appendix with insertion of, though highly important in themselves. A great improvement is observed in obtaining wood at much lower rates than formerly, though what was obtained under previous methods, partly ill cured, and ill delivered, must first be consumed. Of compensations to the local officers, the next board of directors, who have this matter to decide on, may receive any aid our transient investigations may enable us to afford.

We have heard suggestion of abuse of the privilege of free tickets, but we have not supposed it of much consequence, except in connection with the subject of offer of reciprocity with other railroads; and as far as those corporations are concerned, we recommend that the granting of free tickets be confined to officers of the Worcester, Worcester and Norwich, and Housatonic.

We recommend the consideration of improvement in our second class cars.

We also recommend, with a view to economy, a revision of the salaries or compensation of all persons employed on our road, as well as examination of the duties incumbent on each, to be made by the directors periodically; and to have special reference to the value to our interest at each depôt in fixing the compensation of each officer there occupied.

For a conclusion, the Committee hope their constituents will not be wholly dissatisfied with this report of their labors, inadequate as it may be to satisfy their thirst for information. Documents have continually poured in on us, from the Engineer, the President, and other Directors, four at least, of which not one of us have had time to read, several very valuable, undoubtedly, but beyond our day and night capacity, if yet we must print and distribute this Report before 15th March.

An illustration, by a fact, will satisfy the reader, that *our* service has not been a sinecure, more than that of the officers of the corporation and its road. On 24th January, one of our body, in the meeting at Springfield, moved "that the Engineer be requested to furnish, as soon as it can be conveniently done, to this Committee, the following information: The name and weight of each Locomotive Engine purchased for this road, from whom purchased, time of purchase, and cost of each, including expense of placing same on the road chargeable to the corporation, distinguishing between passengers' engines and engines purchased for conveying freight, number of days employed on the road and number of miles accomplished each month, distinguishing where the fuel has been of wood and where of coal, where the Engines have failed to keep the time allotted for their duty, the time lost in consequence, and if the detention has been caused by incompetency or unavoidable causes,

cost per mile for running each engine, including oil, fuel, engineer and fireman, (distinguishing the number of firemen attached to each engine,) also cost of repairs of each engine, particularizing same each month, distinguishing the amount of expense of repairs defrayed by the manufacturer of the engines, as per contract. Time to commence from 1st January, 1842, to 1st January, 1843, and inquiries restricted to engines introduced on the road since former time, including the *whole expense* of two engines purchased of the Port Deposite Railroad Co."

In obedience to this call, besides which there were many others, for documents, they began soon to come, not by dribblets, but instalments, even up to 2d March instant. Among others, sent 7th February, and received the 8th, was an avalanche, in an envelope, never opened until 3d March instant by the member who called for it, he being too busy with other details of our investigation, and not yet looked at, except on its formidable outside, by any other of the Committee. It must be over a thousand pages. On this, relating to a quite small part of that single order, the Engineer, sending other documents that day, writes: "With regard to the other items of information called for in the resolution referred to, I am obliged to lay before you the original records, in part, with some hastily prepared statements, but which will yet afford a general idea of the information sought for by that part of the resolution which relates to the failure of the engines to perform their trips in time."

"It would be impracticable to give a particular account of all the delays, and the causes of them, during the past year. It will, perhaps, be sufficient to state in general, that when they have occurred, they have arisen from a variety of causes to which all railroads are more or less subject."

"The passenger trains have run with a regularity in general which will bear a comparison with any road in

the country. They have, on one or two occasions, been detained by the heavy snow-drifts of the mountainous region through which the road passes, and a few short and unimportant detentions from slight derangements of the machinery might, perhaps, be enumerated; but they have been too slight to become matters of especial record."

"The freight trains have run with less constant, but yet, under all circumstances, with a high degree of regularity. The large amount of business, which has presented itself, and the strong desire which has been felt to accomplish the punctual delivery of the various articles of transport at their destination, have led, it is believed, to such exertions and diligence on the part of every one connected with the road, as to call for the highest degree of commendation. The delays that have occurred may be attributed to the combined effects of high grades and heavy trains, and in a considerable degree to the derangements in the machinery of the heavy freight engines, which were designed to meet the wants of the road, but which proving, upon trial, deficient in strength in important parts, have led in frequent instances, to detention and irregularity."

"The actual cost per mile for running *each engine* it would be impracticable to state. This may be accurately stated with respect to the entire number of miles run by all the engines, as an account is kept of the consumption of fuel and oil required by the engines; yet, as it is not usual, so it has not been deemed necessary, to preserve records of the quantity consumed by each particular engine."

"With respect to the amount paid for the repairs of the engines, and the portion of this amount which is to be charged to the manufacturer, it would be impracticable in the present condition of his unsettled account, to state precisely what that amount will be. It may be sufficient to state, that the contract is supposed to afford an ample guarantee for the heaviest portions of these repairs, and for a

considerable amount of expenditures on account of supposed improvements, which the builder has devised in order to remedy those deficiencies which experience has rendered apparent. A sufficient portion of the price of the engines is retained to afford ample security to the Corporation on this point."

"I have the honor, &c.

JAMES BARNES, *Engineer.*"

Reports on trials of the engines twenty-second and twenty-third February last, and on the Treasurer's accounts, must come into our Appendix, being received too late for copying here.

Our task is ended, but the apology for its incompleteness will be sufficient in the circumstances under which we have labored. We hope not to be blamed for being too long, and we had not time for being shorter. Of the prospects of our road, every stockholder ought to be satisfied. An increase for the year 1843 over 1842, equal to that of 1842 over 1841, is not to be expected, without an extraordinary revival of business beyond hope. A moderate increase, one seventh of last year's ratio, we are confident there will be, perhaps, ten to fifteen per cent. of passengers, and between twenty and fifty per cent. of freight. This, with the certain reduction of expenses, partly accomplished, partly unavoidable, will make the balance of the *second* year's full operations very nearly as much above, as that of the *first* was below, the total charge against our Corporation for everything, expenses of all sorts, interest, sinking fund, and all. We are more than gratified, we are surprised, at the magnitude and success of our business under all the disadvantages of untrained troops in the first campaign. The second we ought to do more than hold our own; and in the third, expect the uninterrupted career of victory.

To this, we all know, economy, universal, systematic,

scrupulous economy, scrupulous about the cents, where tens of millions are to be saved, — systematic in laying out those millions of cents where the healthy juice of the central stock shall reach to every, the minutest, twig, — universal in applying as carefully to the great which superior minds only can think of, as to the small which petty minds may exclusively regard, — economy will be indispensable. Economy is not niggardliness, which loses the service of a superior man who must have a thousand dollars, when an inferior may be procured to supplant him for nine hundred. Economy is prudence, so liberal in great expenditures, though few, as to frighten weakness by the sound of her voice, — so careful in most as to disgust the heedless by severity. Prudence knows laborers will work for us every day, and yet hopes to bring little to pass, unless she thinks, every hour, how to employ them. The representative of Boston sagacity, in Poor Richard's Almanac, proves that one performance may be better than two promises.

Stockholders will diligently inquire, and a true presentment make, whether the investigation of 1843 be as laborious and faithful as the pattern of 1840. We know the result cannot be so unanimously received. We have not sought to conciliate the good opinion of the large class in our community, who, having no shares in our concern, yet manifest great eagerness in the rise or fall of its stock, and hope good bargains may grow out of quarrels among stockholders, or discord at directors' board; but to those who did own in 1840, and the few who have since become partakers with us, we say, unless the Mesmeric sleep be palmed upon our officers and subordinates, or the final consummation of all earthly things come, before 1844, you will never regret, that you now resolve to take encouragement.

JAMES SAVAGE, *per order.*

Boston, March 7, 1843.

Amount of Salaries paid at the different Stations on the Boston and Western Railroad, with the Duties of each Person.

Duties.	Officer.	Station.		Gross Amt.
President	Geo. Bliss	Springfield	3000	
Engineer	James Barnes	Do.	2000	
Clerk and Agent	Richd. D. Morris	Do.	1200	
Book-keeper	Addison Ware	Do.	1200	
Clerk	N. Foster, jr.	Do.	600	
Do.	Thos. Hazzard, jr.	Do.	540	
Do.	G. W. Beales, jr.	Do.	540	
Master Transp'n.	J. S. Moody	Do.	1000	
Clerk do.	J. P. T. Burbank	Do.	600	
Freight Agent	J. F. Annis	Do.	600	
Clerk do.	L. Spencer	Do.	600	
Master Mechanic	Henry Gray	Do.	1095	
Cond. Pass. Train	James Parker	Do.	700	
Do. do.	J. B. Adams	Do.	700	
Do. Freight do.	E. Stoddard	Do.	700	
Do. do. do.	W. H. Horton	Do.	700	
Do. do. do.	R. P. Mason	Greenbush	700	
Road Master	J. S. Potter	Springfield	1000	
Do. do.	P. Anderson	Do.	1000	
Rest. Engineer	John Child	Greenbush	3000	
				21475
Treasurer	J. Quincy, Jr.	Boston	4000	
Clerks and Rent		Do.	2000	
Local Agent	Chas. A. Read	Do.	1000	
Cond. Pass. Train	A. H. Moore	Do.	700	
Clerk & Solicitor	Ellis G. Loring	Do.	750	
				8450
Master Transpr.	W. H. Townsend	Greenbush	1500	
Ticket Clerk	L. D. Abell	Do.	600	
O. Clerk	O. A. Knight	Do.	360	
Freight Agent	S. Witt	Do.	1000	
Do. Clerk	H. H. Babcock	Do.	600	
Master Mechanic	T. W. Allen	Do. 2½ per day	912,50	
Assist. Engineer	F. Harback	Do.		
Do. Mast. Mech.	T. Winans	Do.	1095	dischrgd.
Con. Pass. Train	H. Tilton	Do.	700	
Master Transpr.	S. H P. Lee, jr.	Pittsfield		
" "				6767, 50
" "		Off. ab'sh'd Feb. 1	1000	
Depot Agent	W. H. Power	Pittsfield	600	
Ticket Clerk	S. W. Morton	Do.	500	
				2100
Depot Agent	O. Harrington	Worcester	600	
Do.	A. Frith, Jr.	Clapville	300	
Do.	H. Towne	Charlton	300	
Do.	E. B. Draper	Spencer	300	
Do.	Chs. Flagg	East Brookfield	300	
				1800
				40,592,50

Duties.	Officer.	Station.		Gross Amt.
	Amount of Salaries brought forward,			40,592,50
Depot Agent	H. E. Prouty	South Brookfield	300	
Do.	Arad Gilbert	West do.	800	
Do.	J. F. Hitchcock	Warren	300	
Do.	W. C. Child	Palmer	500	
Do.	C. B. Jenks	Wilbraham	350	
Do.	E. N. Smith	West Springfield	240	
Do.	Seth Mosely	Westfield	300	
Do.	Roland Parks	Russell	175	
Do.	A. E. Jessup	Chester Village	300	
Do.	J. S. Stevens	Do. Factory	300	
Do.	D. McElwain	North Becket	300	
Do.	F. Anderson	Washington	240	
Do.	H. P. Nichols	Hinsdale	300	
Do.	A. D. Briggs	Dalton	365	
Do.	W. T. Lane	Shakers' Village	144	
Do.	E. Williams	Richmond	180	
Do.	J. M. Noble	State Line	420	
Do.	R. Bancroft	Canaan	300	
Do.	J. C. Chapman	East Chatham	300	
Do.	S. P. Lee	Chatham	600	
Do.	J. S. Doane	Kinderhook	300	
Do.	Wm. Smith	Schodack	312	7,526
				47,918,50

Amount paid Brakemen on all the trains, 9960½ days, average 112¼ per day, - - - - - - - - 11,276,04

Amount paid laborers at Springfield depôt, 4547¼ days, average 101¼ per day, - - - - - - - - 4,608,39

Amount paid laborers at Greenbush depôt 8780¾ days, average $101\frac{1}{11}$ per day, - - - - - - - - 8,877,07

Amount paid laborers at other way stations, 15927 days, average $87\frac{74}{100}$ per day, - - - - - - - - 14,135,16

Amount paid for repairs east of Springfield, 14480⅞ days, average $110\frac{24}{100}$ per day, - - - - - - - - 15,964,36

Amount paid for repairs west of Springfield, 15539⅛ days, average 111¾ per day, - - - - - - - - 17,365,59

Amount paid for repairs of Hudson road, 5848¼ days, average $99\frac{4}{100}$ per day, - - - - - - - - 5,792,39

Amount paid for repairs of West division, 9601⅜ days, average $87\frac{76}{100}$ per day, - - - - - - - - 8,496,05

Amount paid Firemen on all the trains, 6246½ days, average $118\frac{54}{100}$ per day, - - - - - - - - 7,404,76

Amount paid Enginemen on all the trains, 5341¼ days, average $196\frac{62}{100}$ per day, - - - - - - - - 10,501,88

$152,270,19

APPENDIX.

(A.)

ENGINES.

Report on the Order of July 8th, 1841.

Since the last meeting of the Board, the Committee have closed a contract with Ross Winans, of Baltimore, for seven merchandise engines, and with the Locks and Canal Company for three of the same model and size as those used on our road for passengers; they have also procured from the Port Deposit Rail Road Company two of Gillingham and Winans' coal engines.

Aware that this is a measure involving considerable responsibility, the Committee feel it to be one of sufficient importance touching the future usefulness and prosperity of the Road, to justify and call for a somewhat minute report.

Immediately after receiving instructions to procure these engines, the Committee addressed a circular to the Locks and Canal Company, Lowell; Hinkley and Drury, Boston; William Norris, and Baldwin and Vail, Philadelphia; and Rogers, Ketchum, and Grosvenor, New York, asking their best terms for engines similar to the heaviest now in use on the Western Road, and also for those similar to the Norris Engine, America.

Mr. Norris declined making engines of the Lowell model, but proposed to furnish those of similar weights and power upon his own plan for $7,750 each.

Messrs. Baldwin and Vail for	8,000
Locks and Canal Company for	10,000
Ross Winans	11,000
Hinckley and Drury	9,500
Rogers, Ketchum and Grosvenor	12,300

Aware that a very powerful engine had been constructed by Ross Wynans of Baltimore, on a different plan from any heretofore used in this country, the Committee judged it best to have it examined, and accordingly Major Whistler went to Baltimore for that purpose.

This engine was constructed with a view to the use of coal, and weighs twenty tons. But the peculiarity which, in the opinion of the Committee, rendered it better suited to the strong grades of the Western Road than any other kind of engine, consisted in the fact that all its wheels are drivers, and its whole weight effective for adhesion, while it subjects the rails to a weight of only fifty-four hundred pounds per wheel, about twenty-five hundred pounds less than our present Passenger Engine.

The extremely low rates at which merchandise must be brought from Albany to Boston, if taken upon the road at all, requires that such trains should be taken, as no engines hitherto in use on any of the rail roads in the United States, are equal to carrying over our high grades.

At the trial, which was witnessed by Major Whistler, the working of the machine in all its parts, and its appearance in regard to durability, were such as induced Major Whistler to recommend a further trial to be had and witnessed by the Committee, with special reference to the several kinds of fuel to be used for the purpose of generating steam.

The Committee being of opinion that coal would be a less economical kind of fuel than wood, on the Western

Road, felt that a further examination was necessary, particularly with reference to her capacity for generating steam with wood, and accordingly Messrs. Lincoln and Jackson were appointed a Sub-Committee for this purpose, with authority to contract for seven of these engines, if after full trial and examination they judged it expedient.

In their visit to Baltimore, and in their experiments, they were accompanied by Mr. Brownell, the chief machinist of the Locks and Canal Company.

This Committee passed over the road on this engine with coal, and a load consisting of sixteen double, one single, and one passenger car, weighing 316,000 lbs. and with wood, with 252,200 lbs.

Her performances, in both these trials, were satisfactory. For a more particular account of them, reference may be had to the Sub-Committee's Report, No. 1, and Mr. Murray's letter, No. 4. For another made by B. and O. R. R. Companies, see Mr. Murray's Report, No. 5.

This engine being particularly adapted to the use of coal, wood could not be conveniently used without alteration in the arrangement of the blower. To be quite certain that this alteration could be introduced without injury to the movements of the machine, Major W. again visited Baltimore and passed over the road, after the alteration had been made, with a load of 265,100 lbs., at the rate of ten miles per hour, stops included; making steam so freely, as to leave no doubt upon his mind as to her capacity of generating steam with wood, as well as other engines. See Major W.'s letter, No. 2.

The Committee expect the power of these engines will prove to be at least 50 per cent greater than any others which have yet been used in New England.

With regard to repairs, Major Whistler, Mr. Brownell, and the Sub-Committee unite in the opinion, formed from an inspection of the machine, that it may be kept in order

at a less expense than any other kind of locomotive they have ever seen.

Her wheels being small, the common chilled wheels, made upon the same plan as the patent car-wheels, answer for this engine. These are less expensive in their construction, and far more durable than any kind ever yet used on any railroad. Outside connections permit the use of straight shafts, and their having but 5400 lbs. (small crank engines on our road have about 8000) resting upon each wheel, must necessarily make them more safe, and much more durable than the ordinary kind of crank shaft. These two items are by far the greatest sources of expense in the repairs of all kinds of engines.

There seems to have been a general impression that coal engines, (the model of which is more like this kind) are in the matter of repairs, much more expensive than the Norris, Baldwin, or Lowell Engines.

If this were so, it would not justify an expectation that Winans' Engine would be like expensive. But a reference to the Sub-Committee's Report, No. 1, and a document, No. 3, furnished by Mr. Murray, superintendent of the B. and O. Road, will shew that eight of Norris's Engines, from one to three years old, running 78,443 miles in six months, cost equal to four, nine-tenths cent per mile, for repairs; and that nine of the coal engines from five to seven years old, running at the same time 77,382 miles, cost five five tenths; and three of Eastwick and Harrison, from one to two years old, ran 23,944 miles, at a cost of five cents per mile. And that, at another trial, when each engine was put into perfect and equal order, and came out of the trial in equal order, the Norris Engine, in running 11,288 miles, cost for repairs, 174,24, Eastwick and Harrison's, 223,67, and the coal engine but 48,97, all running the same distance with equal loads.

It has been supposed also that fuel for the coal engine is

much more expensive than for wood; this of course depends on the cost of wood and coal. The Committee have carefully examined this subject, and for particulars refer to the Sub-Committee's Report, No. 1, and Mr. Murray's Table, No. 3. The result of this shows, that wood on the Western Rail Road, where that article is abundant, and will for many years be very cheap, is the most economical kind of fuel. Hence the anxiety of the Committee to make the matter, as to the capacity of Winans' Engine for burning wood, sure.

It may be recollected that some members of the Board expressed a doubt as to the expediency of using such heavy engines, supposing it better to keep an extra engine near the summit, for aiding a smaller class of engines in surmounting it. This of course would depend on the relative cost of maintaining such an engine, and the extra expense of running a heavy engine on those parts of the road, where a lighter one would be sufficient.

With a view to this question, one of your Committee went on the Providence Road on an engine similar to the heaviest now used on the Western Road, with twenty cars of merchandise, and returned with a load varying from six to twenty cars; noting carefully the amount of wood consumed in each trip, and on different parts of the road.

An engine of common size was then attached to the same load, say twenty loaded cars, and run over the road, the state of the rails, wind, &c., being the same, and it was found that the amount of wood consumed was as nearly the same in both cases, as it would probably have been if both loads had been drawn by the same engine; the wood consumed being in proportion to the resistance overcome, rather than to the size of the engines which do the work. For details of this experiment, see Mr. Jackson's Report, No. 6.

Inasmuch therefore as it will always be a matter of great

importance, (in view of the great number of trains expected to be on some part of this long road at all times) to have the merchandise trains at all places at the proper time, and as this can be insured only by always having a surplus of power, the Committee unite in the opinion that the most judicious course will be to use the large engines for the whole road, — which will leave them in no danger of losing time, except when ascending the maximum grades; which loss, their surplus power on other grades, will very soon enable them to redeem.

By order of the Committee.

(Signed) JOHN HOWARD, *Chairman.*

(B.)

Worcester, August 12, 1841.

Dear Sir,

In conformity with instructions from the Committee on Moving Power, Col. Lincoln and myself have spent several days in examinations and trials of engines at the South. As he was compelled to go into the interior of New York, before we could have an opportunity to prepare a Report, that must devolve on myself.

Unfortunately, on our arrival in Baltimore, we found Mr. Winans had left for Boston. We therefore could only examine his engine, and look for such other facts and information as was needed, with a view to negotiation with Winans on our return to Boston, where we learned he would wait for us.

On Friday last a train of sixteen double, one single, and one passenger cars was prepared, with which we passed over the Baltimore and Ohio Road to the summit near Parr's Ridge.

Weight of the Cars was	152,000 lbs.
" " " Merchandise	164,000 "
Total,	316,000 lbs.

With this load we ran from Baltimore to the foot of the Parr's ridge plane, at the rate of about nine miles per hour, stops not included. This part of the road is almost one continuous succession of curves, very many of which are of not more than 400 feet radius; with inclinations from ten to forty feet per mile; the longer part of it, the flat rail laid upon timber, and in bad order.

The plane at the ridge is about two miles long, laid with the heavy iron rail, and in very good order. Inclination eighty-two and a half feet per mile, with curves on a part of it 1000 feet radius.

The progress of the engine with her train up the plane was as follows:

1st minute,	9 miles per hour.		14th minute,		3.4
2d "	7.3		15th "		4.3
3d "	7		16th "		4.1
4th "	7		17th "		4.1
5th "	8		18th "		4.7
6th "	7.3		19th "		4.1
7th "	6.2		20th "		2.8
8th "	5.8		21st "		1.5
9th "	5.2		22d "		1.3
10th "	5.4		23d "		2.1
11th "	5		24th "		2.1
12th "	4		25th "		3
13th "	2.3		26th "		2.8

Average speed up the plane 4.6 miles per hour, until the load stopped, which was about fifty rods from the head of the plane. Her adhesion was abundant, but her steam power deficient. Mr. Murray, superintendent of B. and O.

Rail Road, said the coal was unusually fine, it having been supplied by his laborers without his oversight, from a car loaded from the bottom of a vessel; and the train having waited for the down trains one hour and a half, the coal in the fire box, which was bituminous, became clogged and caked to a degree that made it impossible to keep the steam up. As stated above, during the first six minutes, speed was kept above seven miles per hour, although the road was here curved, while on the part of it where she stopped, it was perfectly straight. And as the fire slacked, speed continued reducing down to four miles per hour, when steam was shut off for feeding and stirring the fire, which cannot be done while the fan is in motion, and this reduced it to the rate of 2.3 miles per hour.

Steam pressure while a full head of steam was on, was 110. About one and a half tons of bituminous coal was consumed.

At a former trial of this engine, an account of which was sent to Major Whistler by Mr. Murray, she carried over the same ground 310,500 lbs. at the rate of ten miles per hour to the foot of the plane, and 6.2 up the plane.

Our next trial of this engine was with wood. Her load 252,200 lbs. A smaller load was taken because she had never been tried with wood, and it was uncertain what her power would be with that kind of fuel.

Average running time to the foot of the plane, about eleven miles. From this trial I became perfectly satisfied that had her fan been so constructed that it could have been thrown out of gear, or been stopped in any way while the fire was replenishing, she would have made steam much better with wood than coal. With wood, it proved necessary to feed the fire about once in $1\frac{1}{3}$ mile, and as this could not be done without shutting off steam and losing headway, much loss of time was thereby incurred. In three different miles, noted while it was not necessary to in-

crease the fire, her speed was 15.15 and 16 miles per hour, and but eight or nine when it was. On grades of thirty or forty feet, and short curves, wooding almost stopped the engine. It was obvious therefore that she could not pass up the 82½ feet grade without coming to an entire stop, and as we were obliged to wait an hour or two for down trains to pass us, anthracite coal was substituted, with which she passed up the plane as follows:

1st	minute	12.9 miles per hour.
2d	"	12.2 "
3d	"	13.1 "
4th	"	14.6 "
5th	"	14.6 "
6th	"	15.4 "
7th	"	16.3 "
½	"	16.3 "

Such was the state of her fire on reaching the head of the plane, that she would probably have continued on two or three miles farther upon a similar grade, at the rate of fifteen or sixteen miles per hour, without addition of fuel. Steam blowing off strong, at 110. It is evident that wood cannot be used in this engine upon the high grades of the Western Road with the fan arranged as it now is; and equally evident that it may be used economically and very efficiently, if the fan can be stopped while feeding, without shutting off steam. The relative economy of coal and wood is shown by Mr. Murray's statement to Major Whistler, as follows;

Eight of Norris' Engines, in running 78,443 miles, consumed 2023 cords best Southern hard pine wood, which at $4, is $8092, = 10.3 cents per mile. This is probably equal to 2697 hemlock at $3, = 10.3 per mile.

Eleven coal engines, in running 77,382 miles, consumed 1597 tons of coal, at $6, $9582, equal to 12.4.
at $7, 11,179, " 14.4.

Mr. Murray thinks bituminous coal best and cheapest. It may for short trips be cheapest, because much is lost at the end of the trip. These trials show coal to be somewhat dearer now than wood. It is however probable that wood will very soon be dearer on the line of our Road, while the price of coal may be diminished.

In the two trials herein described by the Winans Engine, 1½ tons of coal for 316,000 lbs. gross was used, which at $7, is $10,50; 2¾ cords of wood, for 252,200 lbs. gross was used, which at $4, is $11.

On the score of economy in the amount of fuel used there seems to be no great difference.

Repairs.

Eight Norris Engines in running 78,443 miles, required $3838,73, which amounts to 4.9 cents per mile.

Nine Coal Engines in running 77,382 miles, required $3863.20, equal to 5.54 per mile.

The Coal Engines are from five to seven years old, and the Norris Engines from one to three.

Another trial was made by Mr. Murray, between one of the Coal Engines and one of Norris', both of which were put into the best possible order, and were apparently in equally good order after the trial was completed. Each ran 11,288 miles. Cost of repairs on the Coal Engine, $49.79; on the Norris, $174.24. I presume the grates and fire-box, and possibly the tubes and part of the boiler, may burn out faster with coal than wood, while the wheels of the Coal Engines are less costly, and will probably be kept in repair at considerably less expense. Had the first-mentioned trial been made between the same number of Norris' Engines, from five to seven years old, and then from one to three, I should have expected the difference in favor of the latter to have been as great as it was between the two kinds in said trials. If I were compelled to form an

opinion as to the relative durability of the two kinds of Engines, that is, with a kind of Coal Engine similar to Winans', and the Lowell, Baldwin, or Norris, I should give a decided preference to the former. It appears uncommonly simple, compact, and strong, and passes over the road with less motion, and consequently with greater ease to itself and the rail, than any other engine I was ever upon.

It may be doubted, however, whether the cast iron chilled wheel will give to the engine an equal adhesive power, proportioned to the weight upon drivers. According to the received theory on this subject, wrought iron has more adhesion than cast. Mr. Murray says that in practice he can discover no difference. On the whole, should conclude from the performance of Winans' Engine, that she will be able to carry over the strong grades of the Western Railroad, eighty tons of merchandise six miles an hour, and probably, on all other parts of the road, one hundred tons twelve miles per hour.

With regard to the two engines upon Port Deposit Road, the Company offer them at $4000 each. As Mr. Winans was in Boston, and no time would be lost by delaying this purchase for a few days, we concluded it would be better to authorize him to purchase them, if to be had within certain limits. It is probable they may be bought for about $3500.

(Signed) WILLIAM JACKSON, *per order.*

Col. Howard, *Chairman, &c.*

(C.)

Contract for Engines.

This agreement, made this twenty-sixth day of August, A. D. 1841, by and between Ross Winans and the Western Rail Road Corporation, witnesseth,

That the said Ross Winans agrees with the said Corpo-

ration to build and deliver locomotive engines and tenders for their road, as follows, viz.:

Seven locomotive engines and tenders, including the one already built and exhibited by said Winans at his establishment in the city of Baltimore, all to be similar in their general plan and mode of construction and performance.

The six engines *to be* built, to have additional boiler and fire surface; and *all* to be so constructed and arranged, as to burn wood for the generation of steam.

These engines to be built of the very best material, and in a faithful and workmanlike manner, and the whole to be completed on or before the sixteenth day of December next.

Said Ross Winans agrees to keep these engines and tenders in good repair at his expense, during the first three months of their running, except when repairs are rendered necessary by running off the track, or by coming in contact with something on the track.

Said Winans shall, whenever these engines and tenders, or either of them, are completed, have them delivered on the Western Rail Road fit for use, and to the acceptance of the engineer of the Corporation as soon as possible, and by such route as shall be designated by the engineer of the Corporation, and shall pay one half of the expense of said delivery, the Western Rail Road Corporation paying the other half.

And the said Western Rail Road Corporation hereby agrees to pay the said Ross Winans for these engines and tenders as follows, viz., for each engine and tender complete, eleven thousand dollars.

Payments during the progress of the work to be made at the discretion of the engineer of the corporation, it being understood by the parties to this agreement, that whenever any such payments are made, satisfactory security shall be given to the Western Rail Road Corporation by said Ross Winans, for all such advances in payments, until the whole

shall be completed and delivered, as herein before stated; when, and in consideration of the faithful performance of all the covenants to this agreement, on the part of the said Winans, the balance, that may be due, shall be paid over to him in three separate and equal instalments, at thirty, sixty, and ninety days.

It is also understood by the parties to this agreement, that if any of these engines and tenders shall be completed and delivered on the Western Rail Road as herein before stated, without any advance in payments having been made, then and in that case such engine and tender shall be paid for, within thirty days after said delivery.

It is further understood by the parties to this agreement, that if, during the construction of said engines and tenders, any alterations in the mode of construction be required, it shall be adopted, and any increased or diminished cost attending such alteration shall be added to or deducted from the prices before stated.

It is further understood by the parties to this agreement, that the expenses of delivering these engines and tenders on the Western Rail Road, the one half of which is to be paid by said Winans, (as herein before stated,) is confined to the cost of transportation; the whole risk of loss or damage, while being transported, to be borne by the Western Rail Road Corporation.

It is also understood by the parties to this agreement, that, if said Ross Winans shall engage the Messrs. Baldwin and Vail of Philadelphia to build any of said engines and tenders, then and in that case, the Western Rail Road Corporation will not hold said Winans responsible for the *time* at which such engines and tenders shall be completed, but do not by this absolve him from any other responsibility herein before set forth, in connexion with the building, delivering, and performance of said engines.

Ross Winans of Baltimore having this day engaged us

to build three of the engines and tenders stipulated for in the within agreement, made this day between himself and the Western Raid Road Corporation, we hereby agree with said Corporation, that, in consideration of their acquiescence in our engagement with said Winans, we will build said engines and tenders, and have them ready for delivery at the time specified in the within agreement.

This 26th of August, 1841.

(Signed) BALDWIN & VAIL.

(D.)

Extract of a Letter from E. H. Derby.

4 *State Street, Boston, August* 30, 1841.

GEORGE BLISS, Esq.

My dear Sir, * * * * I trust the contract of the Committee on Engines will prove satisfactory, although my own judgment would have pointed to a different course. I regard the measure as somewhat hazardous, when it is taken into account that the price is fifty per cent. more than Norris asked for his, and that he would have guarantied his to run for *three and a half cents per mile repairs*, and was confident they would draw as much as Winans'; and when we consider too that a dozen roads can be found to testify to the merits of the N. engines, and scarcely any one to the superiority of the Winans. I trust Jackson was not prevented by any personal pique from calling on Norris, and that the combined skill of Baldwin and Winans will make a better machine than either has made before. "Nous Verrons."

Yours truly,

(Signed) E. H. DERBY.

(E.)

Extract of a letter from E. H. Derby, to same.

"New Offices, 4 Exchange Street,
Boston, December 11, 1841.

"Dear Sir, * * * * * With repect to the 'Crabs,' I am glad you are able to get a temporary service from one of them. If they do not however eventually prove a decided failure, and involve us in great and unnecessary *expense* and *delays*, I shall acknowledge I have not appreciated their merits.

"The comparative merits of four-wheel engines will soon be settled in public opinion.

"Within the last sixty days, and particularly since the accident on the Brighton Rail Road, a vast array of facts and arguments has been brought to bear against them in the English periodicals, and I am daily more confirmed in favor of six-wheel engines."

(F.)

Engineer Office, W. R. R.
Springfield, April 20, 1842.

To the President and Directors Western Rail Road Corporation.

In compliance with instructions as expressed in the order of the board of the 30th of March, I have the honor to report that Mr. Ross Winans, of Baltimore, contracted to have his engines ready for delivery in Baltimore, by the 16th December last; the first one was ready on the 18th, and the last, about the 20th January.

Although Mr. Winans failed to have the engines ready in time, I do not consider that he failed in this respect to comply with the spirit of the contract.

I herewith submit a copy of the contract marked A. I also submit paper marked B, shewing the time at which each engine was received on the road, and what was done with each, up to the present date. I also submit paper marked C, showing more in detail the performance of the Maryland.

Although from the operations of these engines since we have had them, the result up to this time has not been as satisfactory as we anticipated after the trials of the Maryland in Baltimore, still I attribute the difficulties to causes natural to the first introduction of such powerful engines, built upon an entirely new model; where some of the parts may prove, and have proved, too slight to resist the great strain they are subjected to, — and not to any defect in the principles upon which they are constructed. And I have now the same confidence in their ultimate success and superiority, as when I first recommended them to be procured. And I feel confident that when certain alterations are completed, which are being made by the builder, they will prove to be better adapted to the economical running of the Western Rail Road than any other engines I am acquainted with. Respectfully submitted,

(Signed) GEORGE W. WHISTLER, *Engineer.*

(G.)

BOSTON, AUGUST 6, 1841.

WILLIAM JACKSON, ESQ.

DEAR SIR — I visited this city for the purp ose of seeing you, in regard to my proposition, for the supply of locomotives to the Western Rail Road Company, which I had the honor of submitting to you several weeks since, but I learn with regret that your absence from home will prevent that pleasure.

I understood, a few days ago, that a gentleman from your company had been in Baltimore, and had concluded, upon the information he obtained there, to recommend to your Board of Directors, a purchase of engines made by Mr. Ross Winans of Baltimore, in preference to any others. I confess I received this information with great surprise, as no person in the employ of any rail road company in Baltimore, can conscientiously recommend the superiority of the engines made by Mr. Winans, after the result of the long trials instituted by *Louis McLane, Esq.*, the President of the Baltimore and Ohio Rail Road Company, between the engines of Mr. Winans and my own. I respectfully refer you to Mr. McLane for the *facts* of the case. The result of the several trials proved the superiority of my machines in two points, viz. "a saving of fuel of 33⅓ per cent. and a saving in repairs of at least 70 per cent. in favor of my machines." Since these trials, the Baltimore and Ohio Rail Road Company have not purchased a single locomotive from Mr. Winans, while they have purchased *eight* from me, and for the performances of my engines, I can refer with satisfaction to Mr. McLane.

I have been informed that some of the officers connected with the Rail Roads in Baltimore are *now* and have been for some time, interested in the sale of the engines built by Mr. Winans; this, then, may probably account for the wrong information received at Baltimore, of the superiority of said locomotives. I regret that the gentleman, one of your Committee, on his visit to Baltimore did not call on me, as I feel convinced that I could have satisfied him on every point. I hope, however, it is not now too late to present such facts to you, as I am confident you will examine into the merits of the whole case with impartiality, being well assured that it is your interest and intention to obtain for the company the best machines that can be made, and at as moderate prices as possible.

When I heard the result of the visit of one of your Committee to Baltimore, and fearing lest his conclusions would give a wrong impression of the actual value of my machines, I called on the *first* officer of the Canal Commissioners of the State of Pennsylvania, who has under his immediate charge, the Philadelphia and Columbia Railway, and requested his opinion in writing of the comparative merits of Mr. Winans' engines and my own, and I beg leave to present you with his certificate enclosed herein. I can obtain a similar certificate from M. Newkirk, Esq. President of the Philadelphia, Wilmington and Baltimore Railway — and also beg leave to refer you to my circular containing certificates from England, Prussia, Austria, Saxony, Cuba, Canada, &c. &c. &c., and more particularly to the Eastern Rail Road Company, Boston.

I will guarantee, that the heavy engines, as specified in my proposition of July 19th to you, will do more work and be more serviceable to your company, than the engines of Mr. Winans' heaviest construction, and which have the adhesion of the whole weight.

As the prices I have offered you are low, and as you have doubtless heard of my recent embarrassment, growing out of my continued sickness, and the difficulties of the United States Bank, it has occurred to me, that, without further explanation, the Committee might doubt my ability to furnish the ten engines I offered to build, at the price, or within the time, named in my proposals. I would therefore say that I have arranged my affairs to my entire satisfaction, and am not only disenthralled, but by the kindness of my friends control a larger capital than I have heretofore had at any time.

I have also several engines in progress, of the size you require, designed for the Reading Rail Road, but on this point, to make assurance doubly sure, I will now engage to deliver the ten engines you require by the fifteenth of De-

cember, at the price named by me, and will forthwith place in your hands, as a guarantee for the performance of my contract, three of my engines of class B. I name the fifteenth of December because I am informed your road will be finished by that time, and it has occurred to me, that you would wish to avail of all your power for freight, while the Hudson River is closed, and I have facilities for completing my contract by that period.

Be pleased to excuse me for the statement I have made, which is not made in the spirit of vanity, or rivalry, or with any design to undervalue the productions of Mr. Winans, but as necessary to place you in full possession of the merits of my case. I expect to return to Boston on *Tuesday* next, and will call upon you.

Your Obedient Servant,
Very respectfully,
WILLIAM NORRIS.

[This letter is not post-marked.]

(H.)

NEWTON, *January* 31, '43.

DEAR SIR, — Herewith I send you Norris's letter of Aug. 1841, in relation to which permit a remark or two:

He referred me "to Louis McLane for the *facts* in the case;" and says the result of his trials of the Norris and Winans engines was "a saving of 33 1-3 per cent. in fuel, and in repairs at least 70 per cent. in favor of my engines."

Mr. McLane could not himself give me "*the facts*," but referred me to Mr. Murray, Superintendent of B. and O. R. R., who did give me the exact cost of each engine for repairs on that road for a year, with the miles run by each. This account, instead of showing 70 per cent. in favor of Norris's

engine, shows, I think, less than 5 in their favor, although they were not so old as the others by three or four years; and in another trial, where each was put into equally good order and each run the same distance, about 11,000 miles, the repair of the Winans engine was very much less than the Norris.

And suppose there had been any truth in Norris's statements, they ought not to have caused distrust of the SEVEN LARGE ENGINES we contracted for, as he knew nothing about them — probably had never seen them. It was the TWO SMALL ENGINES alone that his opinion could have any application to. And, with regard to them, it should be understood, that, at the time of purchasing them, there was no other engine to be found in the country, or out of it, for sale, competent to moving our merchandise trains over the H. and B. R. R. which that company would allow us to put upon that road. Nor did we then suppose we had sufficient time to procure them made; and if there had been time, two engines of a power equal to them would have cost about double the sum we paid for them. And now, after all the experience we have had with them, and all the noise and complaints which have been made about them, I feel *perfectly certain* that the purchase of them was the very best thing that could have been done. Yours truly,

WILLIAM JACKSON.

WM. T. EUSTIS, Esq., *Chairman Sub. Committee.*

(I.)

President's Communication relative to appointment of an Agent to purchase Wood.

WESTERN RAIL ROAD OFFICE,
BOSTON, FEB. 6, 1843.

Hon. JAS. SAVAGE, *Chairman, &c.*

DEAR SIR, — Several of your Committee having asked me for the facts in relation to the employment of an agent for the purchase of wood for the Corporation, and as I find, withal, so great a misapprehension among the stockholders *in the city* upon the subject, I am constrained to ask you, in my behalf, to submit to the Committee, and such others as may desire to see it, the following statement: —

For five or six years prior to my entering upon my present office, and while I was agent of the Corporation, R. D. Morris, Esq., a member of the Hampden bar, was my office clerk and assistant, and we were jointly engaged in the duties of my office, but for much of the time in the adjustment of land damages, procuring deeds, attending upon referees, commissioners, and juries, for the Corporation. During this period his time was exclusively occupied in these matters and in attending to trustee suits and other processes in which the Corporation were interested. When, on 1st March 1842, I was chosen President, with the remaining duties of Agent also, I placed in charge of Mr. Morris more exclusively the duty of adjusting the remaining claims, and the management of several suits then pending against the Corporation; at the same time requiring all the time he could thus spare, to aid me in the accumulating duties of the office at Springfield. And when, on the resignation of Maj. Whistler on 1st June 1842, all *his* powers and duties also were devolved upon me, through the summer, until October 1st, the whole time and talents of Mr.

Morris were more absolutely indispensable to me, both in the office, and abroad over the whole line. Up to that period, there were several important suits against the Corporation, which were prepared for trial by him under my advice, and tried with his assistance. There were very numerous suits against parties in the service of the Corporation, in which the Corporation were summoned as trustees, both before the county courts and before justices of the peace in towns all along a line of over one hundred miles. There were, in addition, trials in many cases before referees for claims growing out of a collision in October 1841; and there were also several suits at Albany by contractors, fiercely contested, one of which was some eight or ten weeks on trial before referees. These processes in Albany claimed some portion of my assistant's time, and those in this state were prepared and the most of them exclusively managed by him. And here I may be permitted to add, that, when, on 1st of June, the Board, contrary to my advice and remonstrances, required me to discharge the additional duty of Engineer, they told me as an encouragement, that I might have and employ any additional assistance which I might want. But, with an anxious desire not to increase the expenses of the Corporation, in this particular, while I was making efforts to reduce them, in all other departments, I resolved to get on, if possible, by extra efforts and labor on the part of Mr. Morris and myself, with such aid as the Master of Transportation at Springfield, (who was a local officer,) could give me in the professional part of the duty relating to the moving power.

In this manner the business of the Corporation was carried along, not unsuccessfully, as I flatter myself, till early in September, when my health and strength failing under it, the interference of my family and personal friends induced me to represent to the Board, that, unless I had the efficient additional aid of an engineer, I must resign my office.

This resulted in the appointment of the present engineer, Mr. Barnes, about 1st of October.

During these four months, in which the running of the road was in my care directly, I had, as I could get time from other engagements, been making a particular investigation into the details of expenses through the line, including the pay-rolls of every class of officers, the local depôt expenses, and particularly into the economy of the purchases of wood, its preparation, inspection and measurement. In consequence, the prices at some of the most Western depôts were reduced from fifteen to twenty-five per cent. or more. But still it was found, that, in the scarcity of fuel, in the district west of the State line, it could not be procured there so cheaply, as to purchase it on the mountains in Berkshire, and transport it, in our empty cars going west, to the stations where needed. The prices on the western stations ranged, exclusive of Greenbush, at about 2 75 to $3 25 per cord, while on the mountains it is procured at about half the latter sum. I stopped most of the former purchases, and directed the Master of Transportation at Pittsfield to purchase and send west a supply for those stations. This was done to a considerable extent. But it being understood from a pending Report, that the Board would abolish that office, I was anxious to make some other provision for continuing the same duty by some one else.

The purchases of wood along the line had been made by the depôt agents in many cases, under the direction of the several Masters of Transportation. During my examinations, I had found that the prices varied at different depôts supplied from the same district, except on the Springfield division; that there was no understanding as to prices between depôt agents in the same vicinity; that much of the wood was badly manufactured for use in the engines; that the inspection was, in many places, imperfect; and the

measurement not sufficiently accurate and close. I became satisfied that a reform was necessary, and I thought it practicable. There being, this year, no director within fifty miles of my office, I mentioned the subject to Mr. Plunkett of Pittsfield. I knew that he was perfectly acquainted with the whole district, where our great supply of wood was to be obtained; and I had justly great confidence in his judgment upon a matter of this kind. He at once strongly advised that the purchase and care of the wood along the whole line should be confided to one competent person, who would systematize the business; and who, he felt confident, would make a great saving to the Corporation, not only in the reduction of prices, but in the inspection and measurement; and he immediately, and of his own accord, named to me my assistant, Mr. Morris, as the most suitable man he knew of to carry out the system successfully, provided he could be spared from other duties; adding, that Mr. M. was perfectly acquainted along the line in consequence of his engagements in settling land damages, that he was shrewd, and his judgment sound in making bargains, and, withal, that he was liked by the farmers, and stood well with them.

Soon after, I broached the subject to Mr. Barnes, and he highly approved of the plan, and of my assistant as the person to execute it, if he could take this addition to his other duties; adding, that it was more important than on the Springfield division, because his successor as Master of Transportation there, was a stranger, entirely unacquainted with the business. Subsequently, I consulted with Mr. Jackson, as I happened to meet him, and the suggestion met his approval, as I think it did that of Col. Lincoln. For myself, I could not doubt on the question. My only difficulty was, whether I myself could get along by thus increasing Mr. Morris's duties *abroad*, particularly as I was much absent, and wished to have him in the office as much

as convenient on such occasions. But, upon considering that the collision cases were principally closed, that the claims for damages on the line were much narrowed down, and some of the pending suits referred to above were finished; and that I should be aided in a troublesome class of duties by an engineer, having charge of the moving power and trains under me, I resolved to take upon myself as much additional duty of the office and on the line as I could attend to; and I accordingly required Mr. Morris to take charge of the wood purchases, and the admeasurement and inspection of it, and particularly the duty of purchasing and transporting wood from the mountains to all depôts which could economically be supplied from that district; and of causing all the wood to be housed and protected from the weather, so far as means were provided. For these duties no additional compensation was to be, or is allowed. It was not considered, or dreamed of, by me, as creating a new office, or appointing a new officer. It was not, in fact, so; but only an increase of duties, and a change of duty, in part, of an existing officer — an officer, I add, whom I could not dispense with in any event, and who must have been retained, while the present organization should continue.

For two or three months past, these duties have been performed by Mr. Morris, and the result, even upon this short trial, has exceeded my most sanguine anticipations. I have no doubt that, by this system, there will be a saving to the Corporation, in the course of the year, of many times the amount of his entire salary. I had, recently, occasion to compare the prices of one day's purchases with the lowest prices previously paid at the same places, and I found there was a saving of $500 in that day's operations.

I have not at hand, *here*, the amount of wood purchases last year; but on the 1st of January there were 9676 cords on hand, at an average cost of $2 83 per cord.

The purchases the present year, for the use of the year, and for securing dry wood for the next, cannot fall much if any short of $100,000. And even a saving of ten per cent. in prices, to say nothing of improvement in quality, is an item of no small importance.

I take the liberty to annex hereto a copy of a note, just received by me from Mr. Plunkett, to which I respectfully ask the attention of the Committee.

I am, Sir, very respectfully,
Your obedient servant,
GEORGE BLISS, *President.*

UNITED STATES HOTEL,
Boston, Feb. 4, 1843.

Hon. GEO. BLISS, *Pres't W. R. R.*

SIR, — Your letter of this date is received, asking of me a statement of the facts which came to my knowledge, at the time of your assigning the duty of purchasing and measuring wood upon R. D. Morris, Esq. I most cheerfully comply with your request, and I do so the more freely because I know that some of the stockholders have attached some blame to you for that arrangement, but I believe they do so without a full knowledge of all the facts. My residence being near that part of the Western Rail Road, where a large share of the wood is purchased for the use of the road, led me early to inquire about the price paid for it, and manner in which it was taken care of and its measurement. I became convinced, that the interests of the Corporation were suffering materially from its being in the hands of too many persons who had other duties to perform, and many of them were not persons having the necessary qualifications to do this part of the service of the road. I believed, that the interest of the Corporation would be promoted by assigning this

duty to some one person, who should take the whole charge of purchasing, measuring and taking care of the wood for the use of the road. I suggested to you early in the fall, that you had better assign this duty to Mr. Morris, as I believed he would do that duty well, and as he had some other interests of the road under his charge, that he might do this and those other duties.

I have carefully watched the operations of Mr. Morris in his purchases, and am well convinced that the Corporation have saved in the last three months, by this arrangement, more than twice his yearly pay.

The fuel for the use of the road will probably cost not far from fifty thousand dollars annually; and it is too important an expenditure to be loosely attended to.

If I erred in judgment in recommending this arrangement, let the blame fall on me.

Respectfully your obedient servant,

(Signed) THO'S F. PLUNKETT.

(J.)

WESTERN RAIL ROAD OFFICE,
Springfield, March 1, 1843.

Hon. JAS. SAVAGE, *Chairman.*

SIR, — At the last meeting of your committee which I attended, one of the directors made strong objections to the great, and as I understood, unnecessary *consumption and cost of fuel* on the road the last year. I have not the precise data before me, by which this was attempted to be shown. But I understood the process to be this :— That in 1840, the miles run, and the cost of fuel used, being given — the cost of fuel used by the engines (all Lowell small passenger ones) was nine cents per mile. That in 1842, the cost of fuel being

$50,773.39 — the miles run by *all* the engines being 397,295 — the miles run by all the Lowell engines (great and small) being 301,210 — if the running of the small Lowell is reckoned, as in 1840, at nine cents — and of the large at twelve cents per mile — and a small allowance be made for consumption of the Lowell over the summit grades — it would leave the balance of fuel to be charged to the 73,985 miles run by the nine Winans' engines — which would be twenty cents per mile run. Thus showing a great excess of consumption by the Winans.

If there has, in fact, been any evil of this kind, I am as strongly desirous as any one connected with the road can be, to ascertain its character and cause, in order that the proper remedy, if any, may be applied by whoever shall hereafter administer the affairs of the road. — For this purpose I have, with much labor, made a minute examination of the details of the consumption of fuel, for three years past, and have prepared a variety of statistical tables, upon the subject, which may be useful hereafter, and which I take the liberty to submit to your committee with such remarks as appear pertinent.

I beg leave however to premise, that, so far as the cost of the wood and much of the coal actually used the past year affects the question, I cannot personally be held responsible for any excessive cost, for nearly all the wood used in 1842 was purchased or contracted for before the road was put under my care, and my only purchases of coal were for the last half of the year, and it was delivered on the Greenbush dock at not exceeding $5.25 per ton.

But this is comparatively of little moment, as it is alleged that there has been an extravagant *consumption* of fuel during the year, and this is ascribed to the use of the Winans engines.

The fallacy of this specious position I design to expose.

I concede that, in 1840, the fuel used upon the road cost

but 9 c. $\frac{33}{100}$ per mile run by the Lowell engines — no other engines being then used ; and that in 1842, the fuel used cost 12 c. $\frac{77}{100}$ per mile run by engines of all kinds. But then it must be borne in mind that, in 1840, the road was opened only between Worcester and Springfield — the business was a simple one — all the engines were the small Lowell passenger engines, and the business was principally for passengers, and the grades of the road light compared with those west of the river.

And so far as the merchandise business of that year is considered, doing it with engines of this light class, it is very deceptive to estimate the fuel *per mile run*, without regard to the tonnage carried, which is the more important element.

It seems to me indispensable, in forming a just estimate upon this subject, to ascertain accurately the *character* and *amount* of business done in any year, by a given consumption of fuel.

For this purpose I have prepared, and annex hereto, marked A 1. a table showing the comparative business done and the cost and consumption of fuel in each of the years 1840, 1841 and 1842.— By an examination of this, it will be seen, that the receipts from merchandise transportation, and the miles run by merchandise trains in 1840, were but a little more than half the receipts from passengers, or the miles run by passenger trains. While in 1842 — to say nothing of high grades and other matters affecting the issue, the receipts from merchandise were nearly equal to those from passengers — and the miles run by merchandise and passenger trains are as 158, 091 to 213,862 — a little over 2 to 3. The same comparison of 1841 and 1842 shows even a less proportion of business by merchandise trains in 1841.

Now it will be conceded by every one at all acquainted with the subject, that the freighting business over the *same*

road, and the same grades, is much more expensive, and requires a greater consumption of fuel than a passenger business — and it was unreasonable to expect that our business in 1842, with a great disproportion of merchandise, could be done at the same or nearly the same expense of fuel per mile, as for a very different business in 1840, over the same line of road.

But the business of 1842, has been done over the high grades of 74 to 83 feet per mile between Springfield and Pittsfield, and that for many continuous miles on both sides of the summit, requiring a great increase of power and of course a proportionate increase of fuel per mile.

Then, again, through the greater part of the year, all our heavy business was done over the Hudson road with grades of eighty-six feet per mile — and with a track so light and unstable, as to offer a resistance to the engines, double that upon our own rail — making that fifteen miles of road equal at least to thirty miles of our own.

During the greater part of the heavy freighting season of 1842, also, there were two and often three merchandise trains per day over the road with twenty ton engines. These had a daily business at the numerous way stations on the road, where they were obliged to stop to deliver and receive cars, and for getting wood and water. One conductor had charge of the whole, and the way bills for them, and they were thus kept together. A delay of one train for business necessarily delayed the others, and increased the consumption of fuel in all. The same effect was produced by delays for wood and water for all, before one proceeded. It may be said, that this was unnecessary, and that trains should have proceeded and separated without waiting for each other. But they must run by a time card, or interfere with the passenger trains, and with four regular daily passenger trains on a road

of a single track, and four to six daily merchandise trains running at irregular times over the road, the confusion of trains would have been destructive, and the delays, and the consequent consumption of fuel, would have been greatly increased, to say nothing of the great danger of frequent collisions of the passenger and freight trains, and the constant terror to which travellers would be subjected.

Perhaps this evil may be provided against by farther experience. But a practicable remedy has not yet been discovered.

Then it is worthy of note, that although, in 1842, our receipts from merchandise business were not quite equal to those for passengers — yet the prices for merchandise in 1842, were from 50 to 100 per cent. less than in 1840, quite the latter sum upon articles making the largest amount in 1842. Of course there was, in 1842, a great excess of tonnage over 1840, in proportion to amounts received in each year. If the tonnage carried in 1842 had paid the prices charged in 1840, the receipts for merchandise would have been 50 to 75 per cent. more than for passengers in 1842. The weight carried was therefore in 1842 excessively disproportioned to that in 1840 — and required a proportionate increase in consumption of fuel. And this was much enhanced by the high grades in 1842.

And it must not be forgotten that, in 1840, the small Lowell engines carried all the merchandise, taking small loads, and of course running full double the number of miles they would have done, if of double the power — say for eighty tons of merchandise making two trips of one hundred miles each, or two hundred miles — when a large engine in 1842 would carry the same at one trip, or one hundred miles; thus reckoning the fuel per mile in 1840 without regard to the weight carried.

It is also a fact which cannot be controverted, and which is confirmed by the master mechanic who daily made up the trains, that the *passenger* trains in 1842 were fifty per cent. heavier than in 1840. Of course requiring for these a proportionate greater consumption of fuel.

The business of 1841 was done principally by the Lowell engines — the two small Winans and two Norris, hired of the Hudson company, operating for us on fifteen miles of the Hudson, from two to four months at the close of the year. The cost of fuel per mile that year was nine cents. The business was very similar to that of 1840.

I contend therefore, that for the *kind* and *amount* of business done in 1842, the cost of fuel was less, or its consumption more economical than in 1840, or 1841. But, in order to test this position more accurately, and to make it sure, I propose to submit some farther statistics, drawn from official returns in the office.

Table B 1. annexed shows the *monthly* consumption of fuel on the road for all purposes in 1842 — with its cost — cost per mile run, and number of miles run — monthly.

Table C 1. shows the monthly running in 1842 — of the aggregates of the different *classes* of engines — Lowell, Winans and Hudson — with the cost of fuel used on the road, and the cost per mile — the cost of fuel in engines only, and this cost per mile — all *monthly.*

Table D 1. is a comparative statement for 1841 and 1842, of the weight of the several classes of trains, the tonnage transported including cars, and the miles run by each class, with the cost of fuel and the cost *per ton, per mile,* in each year. The data are from official returns, except the weights of trains, and these are as estimated by the master mechanic who made up the trains. The merchandise trains in 1842 were heavier than in 1841, but are here rated the same.

Assuming this incontrovertible position, that the work done is the best criterion, it clearly appears by this last table, that the year 1842 shows the greatest economy in the consumption of fuel. The whole consumption in 1841 being $\frac{188}{1000}$ of a cent per ton per mile, and in 1842 $\frac{183}{1000}$ of a cent per ton per mile.

But to show the utter fallacy of the reasoning which charges an excess of consumption of fuel in 1842 to the Winans engines, I refer to the data, strictly official, presented in table C 1. Here the consumption of fuel each month is given, in connexion with the miles run by *each class* of engines, and if the position I controvert were true, the consumption of fuel per mile run, should be greatest, in the months when the Winans engines ran the most. A glance at this table will show the reverse of this. Take for instance January and October. In October the Winans engines ran 10,723 miles — more than in any one month — or above $\frac{1}{4}$ the whole running that month. In January they ran but 2936 miles, or less than $\frac{1}{5}$ the whole running, yet in October the cost of fuel per mile run was but $11\frac{1}{2}$ cents, while in January it was 14 cents. In October and November there was an immense merchandise business as per table A of printed annual report, each more than 25 per cent. above any other month. Take again October where the Winans ran above $\frac{1}{4}$ the whole, and November, where they ran $\frac{1}{4}$ the whole — the cost of fuel per mile in October was $11\frac{1}{2}$ — and in November for less proportion of the Winans, the cost was 14 cents per mile. In August and December, the whole running of all engines for each month is about the same, and the running of the Winans in each nearly alike — yet the cost of fuel in August was 11 cents, and in December $14\frac{2}{4}$ cents, per mile.

Under this exhibit, and similar ones for other months, it is useless to contend, that because the fuel in 1842 cost $12\frac{2}{4}$ cents

per mile run, and in 1840 and 1841 but 2¼ cents, the difference is to be ascribed to the extravagant consumption by the Winans engines in 1842. The true and only reasons have been before given; in the great and disproportionate excess of heavy business done in 1842, and done over the high grades of the Western and Hudson roads, to which may be added the delays necessarily attending two or three merchandise trains each way per day, in considerable portions of the year. The solution is given in concise terms in Table D 1, annexed, and I challenge any one to controvert either its premises or results.

It is proper to add, also, that before these engines were contracted for, Mr. Jackson, one of the purchasing committee, expressly with a view to test this principle, went on to the Providence road, where a freight engine was first taken over the road with a light load, and afterwards with a heavy one, the consumption of fuel being noted in each case, and it proved to be very nearly in the proportion of the work done on each trip by the same engine. Similar experiments were made on the Baltimore and Ohio road before this purchase, and with the same results.

In conclusion, I beg leave to refer to the report of Major Whistler, before you, detailing trials of the Maryland with coal in five successive days, in April, 1842. The result then was, $\frac{1}{5}$ of a cord of wood and $2\frac{3}{5}$ tons of coal per trip of 100 miles; equal to $2\frac{1}{2}$ tons coal. This, at $5,50, the price last year, would be $13\frac{3}{4}$ cents per mile run; at $5,00, the present price, it is $12\frac{1}{2}$ cents per mile.

I refer also to the trials of the Illinois (Winans), and Rhode Island (Lowell) by Mr. Jackson, in August, 1842, with full loads over the summit grades — also before you. The Winans' consumed $6\frac{1}{2}$ cords per 100 miles, and the Rhode Island $4\frac{3}{4}$; the Winans being delayed one hour the most. With this

allowance, the consummation was, as near as may be, in proportion to the loads taken, and the power of the engines. At $3,09 per cord, the average price of 1842, the fuel used by the Lowell was 14 $\frac{67}{100}$ per mile. Again, last week, a trial was had by order of your committee, in presence of several scientific gentlemen. The Massachusetts (Lowell), and Arkansas (Winans), started from Springfield to Pittsfield, with loads. The track was snowy, and the trial was not entirely satisfactory — at 28 miles, the Massachusetts gave out through some derangement in her steam apparatus; she burnt 2 cords of wood on the trip *up*. The Arkansas, 2 cords 80 cubic feet up and down, as one of the invited gentlemen gives me the account. This, at $3,09 per cord, is 14 $\frac{6}{10}$ cents per mile for 56 miles. Very respectfully,

Your ob't. ser'vt.

GEORGE BLISS, *President.*

A. 1.

Table showing the comparative Business done, and the Cost and Consumption of Fuel on the Western Railroad, in 1840, 41, *and* 42.

	BUSINESS DONE.			MILES RUN BY			FUEL CONSUMED.										
Year.	No. of Passengers.	Receipts from Passengers.	Receipts from Merchandise.	Passenger Trains.	Merchandise Trains.	Total, including Extra.	Wood, Cords.	Value of Wood.	Cost per Cord.	Coal, tons.—lbs.	Value of Coal.	Cost per ton.	Cost of all Fuel.	Cost of Fuel in Buildings.	Cost of Fuel in Engines.	Cost in Engines, per mile.	Cost of all Fuel, per mile.
																cts.	cts.
1840	65,310	$70,890 79	$38,359 78	53,595	32,710	94,404	2,182	$8,433	$3 86	94 . 1,747	$283	$11 40	$8,716	$550	$8,166	8.65	9.23
1841	109,942½	113,841 85	64,467 14	103,723	45,754	160,106	4,194	13,723	3 27	90 . 785	679	7 59	14,401	656	13,745	8.58	9.00
1842	190,436½	266,446 83	226,674 61	213,869	158,091	397,295	12,846	39,695	3 09	1750 . 285	11,078	6 32	50,773	1,452	49,321	12.41	12.77

B. 1.

Table showing the monthly consumption and cost of Fuel on the Western Railroad, in 1842.

Months.	WOOD.						COAL.						TOTALS.				MILES RUN BY		
	Cords.	Amount.	Cost per cord.	Consumed in buildings.	Consumed by engines.	Cost in engines.	Tons.	Amount.	Cost per ton.	Consumed in buildings, &c.	Consumed by engines.	Cost in engines.	Total cost of wood and coal.	Total cost of wood and coal in engines.	No. of miles by engines.	Cost of fuel in engines per mile.	Passenger engines.	Freight engines.	Cost of all fuel per mile.
	cords ft.			cd. ft.			lbs.			tons. lb.	tons. lbs.					cts.			
January.....	909.8	3390.63	3.73	35.56	873. 80	3258.70	110.1073	852.14	7.97	20.1073	80.	694.80	4244.77	3953.50	28.160	14.039	17.014	9.650	15.07
February....	708.15	2437.18	3.44	31.23	676.120	2328.67	69. 704	589.95	8.50	10. 964	58.1740	500.39	3027.13	2899.06	25.386	11.144	15.076	9.269	11.53
March.....	702.38	2590.50	3.40	21.38	741.	2519.40	103.1783	810.34	7.79	11.1683	92. 100	720.57	3400.84	3239.97	28.275	11.458	16.948	10.077	12.42
April.....	829.94	2513.62	3.03	19. 6	810. 88	2455.94	131. 675	866.34	6.52	6. 675	125.	815.	3379.96	3270.94	29.191	11.204	16.383	10.006	11.57
May.....	1025.79	3047.06	2.97	6.	1019. 79	3028.24	166.1500	1086.	6.53	1. 500	165.1000	1080.71	4133.06	4108.95	33.751	12.174	19.010	11. 684	12.24
June.....	1142.45	3776.86	3.31	0.64	1041.109	3775.21	153. 300	995.50	6.50	1.	152. 300	989.	4772.36	4764.21	34.597	13.770	19.636	12.258	13.79
July.....	1084.48	3398.47	3.13		1084. 48	3398.47	98.1600	671.25	6.71	1.1000	97. 600	661.19	4069.72	4059.66	34.995	11.601	19.191	13.362	11.62
August.....	983.49	2954.54	3.00		983. 49	2954.54	159. 950	878.69	5.52	1.1500	157.1450	868.96	3833.16	3823.50	34.634	11.039	20.480	12.945	11.04
September...	1166.78	3428.04	2.94	4.72	1162. 36	3416.87	157.1000	1085.50	6.48	1.1500	165.1500	1074.16	4513.54	4491.03	37.448	11.984	17.498	16.454	12.05
October.....	1329.92	3897.61	2.93	13.28	1315.122	3855.73	169.1500	933.62	5.49	5. 200	164.1300	905.62	4831.23	4761.35	41.279	11.534	16.744	23.410	11.70
November...	1422.17	4075.06	2.87	33.60	1388. 85	3985.45	225.1556	1241.78	5.50	23.1556	202.	1111.	5316.84	5096.45	36.242	14.062	16.262	17.335	14.39
December...	1483.21	4185.78	2.82	47.04	1435. 45	4047.69	193.1640	1067.	5.50	34.1640	159.	874.50	5252.78	4922.19	33.237	14.764	19.690	12.341	15.75
Total.....	12,846.2	39,695.35	3,09	212.67	12,633.93	39024.91	1750.281	11078.04	6.32	120.291	1629.1990	10.95.90	50,773.39	49320.81	397.295	12.414	213.862	158.091	12.77

C. 1.

Table showing the miles run by the different kinds and classes of Engines, and the cost of fuel on the Western Railroad, in 1842.

Month.	3 Lowell Freight.	12 Lowell Passenger.	Total. 15 Lowell.	7 Winans Freight.	2 Small Winans.	Total. 9 Winans.	Hudson & B. 2.	Totals.	Cost of all fuel.	Cost of all fuel, per mile.	Cost of fuel in Engines.	Cost of fuel in Engines, per mile.
									$	cents.	$	cents.
January,	4,746	17,164	21,910	1,761	1,175	2,936	3,114	28,160	4,244.77	15.07	3,953.50	14.03
February,	2,998	16,619	19,617	1,870	511	3,161	2,608	25,386	3,027.13	11.53	2,829.06	11.14
March,	4,324	16,743	21,067	3,527	1,233	4,760	2,448	28,275	3,400.84	12.02	3,239.97	11.45
April,	4,821	16,831	21,652	4,074	1,129	5,203	2,338	29,191	3,379.96	11.57	3,270.94	11.20
May,	5,132	20,161	25,293	4,300	1,198	5,498	2,960	33,751	4,133.06	12.24	4,108.95	12.17
June,	5,806	21,380	27,186	3,434	1,129	4,563	2,546	34,597	4,772.36	13.79	4,764.21	13.77
July,	6,318	21,272	27,590	3,899	1,210	5,109	2,296	34,995	4,069.72	11.62	4,059.66	11.60
August,	3,644	20,431	24,075	6,724	1,152	7,876	2,685	34,634	3,833.16	11.06	3,823.50	11.03
September,	6,676	22,787	29,463	6,333	747	7,080	905	37,448	4,513.54	12.05	4,491.03	11.98
October,	6,513	24,033	30,546	10,021	712	10,733		41,279	4,831.23	11.70	4,761.35	11.53
November,	7,074	20,057	27,131	7,969	1,142	9,111		36,242	5,316.84	14.39	5,096.45	14.06
December,	5,120	20,562	25,682	6,313	1,342	7,655		33,337	3,252.78	13.75	4,922.19	14.76
Totals,	63,132	238,078	301,210	61,305	12,680	73,985	22,100	397,295	50,773.39	12.77	49,320.81	12.41

D. 1.

Table showing the cost of fuel on the Western Railroad in 1841 *and* 1842, *in proportion to the tonnage carried, or work done.*

Year.	Description of Trains.	Miles run.	Weight of Trains, exclusive of engines and tenders.	Tons transported one mile.	Cost of fuel.	Cost of fuel per ton per mile run.
1841.	Passengers.	103,723	22 tons.	2,281,906		
	Large fr. eng.	24,658	140	3,452,120		
	Small do.	21,096	70	1,476,720		
	Extra.	10,629	35	372,015		
		160,106		7,582,761	$14,401	$\frac{183}{1000}$
1842.	Passengers.	213,862	33	7,057,446		
	Large fr. eng.	124,437	140	17,421,180		
	Small do.	33,654	70	2,355,780		
	Extra.	25,342	35	886,970		
		397,295		27,721,376	$50,773	$\frac{183}{1000}$

(K.)

Boston, *February* 11, 1843.

At a meeting of the Committee of Investigation last evening it was voted, unanimously,

That the President of the Western Rail Road Corporation be requested to direct Mr. Barnes, the engineer, that a full and fair trial be made of the Winans engines, in competition with any other of the freight engines on the road, selecting the best, naming the engines, and giving notice to this Committee, at least one week previous to the trial — the same to be previous to the first of March.

Voted, That Messrs. Ward, Pickering, Darracott, and Dickinson be a Committee to attend to this trial, with authority to invite any gentlemen they please to witness it, and report the result.

Boston, *March* 6, 1843.

Hon. James Savage, *Chairman*,

Dear Sir, — In accordance with the vote of the General Committee, the Sub-committee, to whom was referred the trial of the engines upon the Western Rail Road, have attended to that duty, and respectfully beg leave to report,

That in company with a number of scientific and practical engineers, the names of whom are as follows, viz.:

William Parker, Esq., Superintendent of the Boston and Worcester Rail Road.

Charles C. Storrow, Esq., Superintendent of the Boston and Lowell Rail Road.

W. Raymond Lee, Esq., Superintendent of the Boston and Providence Rail Road.

T. Willis Pratt, Esq., Superintendent of the Norwich and Worcester Rail Road.

W. T. Whitwell, Esq., Superintendent of the Lowell and Nashua Rail Road.

Increase J. Hill, Esq., Superintendent of the Eastern Rail Road.

William Waterman, Esq., late of the Hudson and Berkshire Rail Road.

Joseph Nason, Esq., of Boston.

Holmes Hinckley, Esq., (firm of Hinckley & Drury) Engine Builders.

George Brownell, Esq., Engine Builder, Lowell.

Benjamin A. Woodworth, Master Machinist, Boston and Worcester Rail Road, —

Your committee visited Springfield on Tuesday afternoon, February 21st, and on the following morning commenced the experiments recommended, for the purpose of testing the ability, and economy of the Winans engines, as compared with other motive power in use upon the road.

As these experiments were made under the supervision of

gentlemen, who have great experience and are much more competent, than are your committee, they would respectfully refer you to their reports herewith annexed, as to their performances during the two days, rather than to any opinions of their own.

Your committee understood, and they confidently believe, that upon one point, as regards these engines, there will be no dissenting voice, viz.: that the main feature, in which these engines differed from all others, in use upon the road, is, their having eight wheels, all of which are drivers, thus making the whole weight of the machine effective, while it is so distributed as to produce the least possible injury to the road.

Your committee cannot allow this opportunity to pass without tendering their thanks to each, and every gentleman who accompanied them, for their patience and perseverance, which they evinced in endeavoring to arrive at all the facts, which would have any bearing on the case, and your committee can only regret that the state of the road, as well as the extreme degree of cold, should have prevented a much more full, and consequently a more satisfactory course of experiment.

It was understood by your committee that those gentlemen who were engineers, and in charge of rail roads, would make a joint report, while those who were engine builders would express their views separately.

Your committee annex a report of the several engineers in charge of rail roads — a letter from Holmes Hinckley, Esq., one from George Brownell, Esq., and also one from William Jackson, Esq.; all of which are submitted as a part of this report. Very respectfully, &c. &c.

WILLIAM WARD,
ARTHUR PICKERING,
GEORGE DARRACOTT,
JOHN DICKINSON,
} *Committee.*

Boston, Feb. 28th, 1843.

William Ward, Esq., *Chairman of Sub-Committee of the Stockholders of the Western Railroad.*

Dear Sir, — Having accompanied you to Springfield, at your request, to witness a trial of the engines constructed by Mr. Winans for the Western Railroad, and understanding that you are desirous of obtaining from us some opinion concerning them, we will offer you such observations as the result of these trials, and of our very limited observation during two days of winter, will enable us to make.

On Wednesday, Feb. 22d, all of the trials with the Winans engine "Indiana," were unsatisfactory, probably from the presence of a new fan or blower which was found to obstruct, rather than to assist the draught of the chimney.

On the first trial, this engine drew 387,440 lbs. of cars and lading behind the tender up the inclined plane at Springfield, a small portion of which has seventy feet per mile of ascent, and more of it sixty-six feet, the remainder being mostly of sixty feet to the mile. The length of the plane is two miles and three thousand feet nearly. The time of ascent was twenty-six minutes.

It was found necessary, however, when about half way up to remove the netting from the chimney top and to place an additional pipe upon it, thus increasing the draught of the chimney *in a mode* which is inadmissible in practice.

The other trials of this engine, in which the netting was retained in its place, were still more unsatisfactory from the same cause, want of steam, and are not worth detailing.

The Lowell engine "New York," was then started up the plane with a load behind the tender of 340,340 lbs.

This load was evidently too much for her adhesive power, she slipped all the way up, though her steam held out abund-

antly. She did, however, succeed in taking up the load in thirty-eight and a half minutes.

The "Arkansas," Winans' engine, coming from the west with a train of merchandise in the latter part of the same day, took the same load of 340,340 lbs. up the plane in nineteen and a half minutes, being just as she came from work, and without the new blower which had been put upon the "Indiana."

On Thursday, Feb. 23d, the Winans engine, "Arkansas," took a load of 277,000 lbs. behind the tender and went to a point three miles beyond the Chester factory depôt, and returned in the early part of the afternoon. She failed in steam at one point of the road, but after leaving Chester factory depôt, beyond which was the only severe trial, she performed well until snow on the track obstructed her progress. The *netting* was then raised to get draught and the *extra pipe* attached, after which she proceeded a short distance until serious snow drifts prevented. We do not doubt that but for snow on the track the whole way up, she would have had steam enough without disturbing the netting to accomplish the ascent.

On this trip, the "Arkansas" was preceded by the Lowell engine "Massachusetts," with a load of 254,000 lbs. The Massachusetts was not in good working order, and finally stopped just before reaching Chester factories. The rails were much encumbered with snow, and the whole trial was unsatisfactory as a test of power or of economy of fuel; the latter of which would require many trials to be settled. Both engines on this part of the trial lacked steam.

In the afternoon of the same day, the "Arkansas" took up the Springfield plane a load of 390,040 lbs. behind the tender, making the ascent in twenty-three and a half minutes without removing the netting and without losing steam, much to the

satisfaction of all who observed it. This load, reckoning in her own *gravity* and the gravity and friction of the tender, is equal to more than one sixth of her entire adhesion of 45,500 lbs. or it is equivalent to 340,363 lbs. or one hundred and seventy tons behind the tender on the eighty-three feet grade above the Chester factory depôt. No tendancy to slip was discovered.

The performance of the "New York" on the afternoon previous, in which her adhesion was half the time insufficient, was equivalent by the same mode of computation to $\frac{4}{17}$ of her adhesive weight (assumed at 28000 lbs.) or to 297,024 pounds behind the tender on the eighty-three feet grade.

From these trials we can say, therefore, that, as regards the power of the Winans engine to draw, over the eighty-three feet grade, loads of eighty tons of merchandise and sixty tons of cars, in all one hundred and forty tons behind the tender, which we were told was the performance expected of them, and for which they were constructed, we have no doubt whatever that they are equal to it, because we have seen them do more.

In answer to the question, whether these engines "possess any defect in principle which cannot be remedied," we say that we saw none such and do not believe that any such exists.

The principal fault alleged of them, is the frequent deficiency of steam. This we observed in the "Indiana," and attributed to the blower or fan attached to her. We observed it too in the "Arkansas," on parts of her trip from Springfield west, and we are inclined to the belief that it is not unfrequent; but the "Arkansas" had plenty of steam in all her trials *at Springfield* and the same on the *severer trial* above Chester factory depôt, until the resistance occasioned by snow on the rails diminished the speed so as to affect the draught of the chimney.

This fault, so far as it exists, does not seem to us to arise from want of fire surface, so called, nor of furnace, for these engines have much more of either than any other locomotives. But it seems probable that it arises from the short chimney rendered necessary by the upright position of the boiler. If so, this want of draught can probably be obviated and perhaps at a comparatively small expense. Some of us *know* of cases, where such a fault *has* been obviated by a very trifling change.

As to injury to the road from side motion, we think there is nothing to apprehend on that score. These engines have an ease of motion greater than any other engines with which we are acquainted.

The consumption of fuel is a point, on which we have not sufficient materials to form an opinion. Even if we had succeeded in making the trip to Pittsfield, as we proposed, measuring carefully the fuel and water, we should not have had much light on the subject, which properly requires a long experience.

The sum charged in the company's accounts as spent for repairs on these engines, viz. $6,511.28, should be diminished, as we were informed, by the sum of $2,313.39, spent for alterations and experiments to perfect the machine, and for replacing certain weaker parts by others of greater strength, leaving $4,197.89, for the true cost of *repairs*. These engines were stated to us to have run 73,000 miles. This expense for repairs upon them is below the average per mile on a large number of railroads, and is certainly not extravagant.

As regards the peculiar principle of these Engines, which is to furnish abundant adhesion and yet diminish the weight on the wheels below what is usual on other Engines, we regard it as of very great value, and one which should not on

any account be relinquished. It is peculiarly important to the Western Rail Road, because the steep grades, requiring great adhesion to surmount them, are continually offering the temptation to increase the weight on the driving wheels beyond what is judicious and economical for the road.

We would recommend to put these engines regularly to work upon the road with the best expedients that can be devised for the improvement of the draught of their chimneys, to keep an account of their fuel, their repairs, and the time of performing their trips, giving them, as far as the business of the Road furnishes the means, as large loads as the builder recommends for them. Should they in fact prove to carry, for a length of time, a certain amount of freight at the desired speed, with an expense not materially *greater* on the whole per ton carried, than other engines, their abundant adhesion and the small weight upon each wheel would give them the preference for slow and heavy freight trains.

We are, very respectfully, your obedient servants,

CHARLES S. STORROW,
J. WILLIS PRATT,
WILLIAM PARKER,
WILLIAM S. WHITWELL,
JOSEPH NASON,
JOHN CHILDE.
W. RAYMOND LEE.

BOSTON, FEB. 25th, 1843.

WM. WARD, ESQ.

DEAR SIR — As you desired, I now say a word in regard to the trial of the Locomotive Engines on the 22d and 23d instant, at Springfield, on the Western Railroad.

As I did not take minutes of all the various particulars of the operations, from which to obtain data to make up a defi-

nite statement of the result, I shall not pretend to state such result of trial myself — particularly, as there were gentlemen of the party who were very competent, and very minute in noting the various data of the trial, from whom, without doubt, you will get a clear and accurate statement of the comparative merits of each machine, on said trial, in that respect.

I felt more deeply interested to ascertain the operation of Engines on the plan of eight drivers, all connected — which was one grand point, with me, to be tested on that trial.

There were some doubts in my mind whether the Winans machines, with eight connected drivers, would move with ease round the various curves of the road; but, as far as I was able to discover, there was no difficulty on that score. Neither could I discover, on examining the flanches of the wheels, that there was any unusual wear, which might have been expected in working hard against the rail. And I must say, that I have more confidence in the plan of a Locomotive of eight connected drivers, than I had before the trial — for I conceive there are advantages in the principle of eight connected drivers, in a Locomotive, over Engines with a less number of drivers, in cases where it is desirable to draw great loads at a low speed, provided the arrangement does not injure the road.

In case, however, I were to get up machines with eight drivers, I should make a different arrangement, particularly with regard to the boiler; and instead of using a vertical boiler, with short tubes, I should use a horizontal boiler, with long tubes.

But, after all, this might be considered a matter of taste with the builders of the machine — for I found gentlemen, at the time of trial, who contended that there is as much economy in the consumption of fuel in the use of the short, up-

right tubes, as in the long, horizontal ones. Yet I must, at this time, with my present experience, say that I cannot agree with them.

Now, as to the important point which, I presume, you are all trying to get at — viz., whether the Winans will draw freight, over the Western Railroad, with as much economy, in regard to fuel, repairs, &c., as compared with other Engines now in operation on your road — the short time I witnessed the operation of the Engines does not enable me to give an opinion as to their comparative merits. But I consider that fact may be easily ascertained; and my method to do so would be to put each machine to work, at the usual business of the road, for three or four months, noting the quantity of fuel consumed, the amount of repairs required, the number of miles run, and the amount of freight conveyed.

I believe it is admitted that the Winans machine has not power equal to her adhesion; but I do not consider that of any consequence, if the amount of power obtained is at as little expense as the same amount in other machines.

Respectfully your ob't. serv't.

HOLMES HINKLEY.

LOWELL, *February* 28, 1843.

WILLIAM WARD, Esq.

Chairman Sub-Committee of Stockholders of the Western Rail Road.

DEAR SIR, — I have just received from Mr. Parker, the detailed account of the trial of the Engines on Wednesday and Thursday last on the Western Rail Road, and by the result it is evident, that the Engine Arkansas, built by Mr. Winans, did carry a load more than equal to eighty tons over the highest grade on said road, which, as I understand, was

more than the committee or Mr. Winans promised that they would carry.

I think the principle of the Engine is good, so far as coupling all the wheels and distributing the weights equally on every wheel. The other arrangements could be in my opinion very much improved, especially the boiler, which cannot, without the very best of fuel and the very closest attention, make sufficient steam to carry the load required. The proportion of water evaporated to the fuel consumed is much smaller than it should be, the fault of course is in the boiler. As to the precise quantity compared with the Lowell Engines I cannot tell without a more satisfactory trial.

Yours very respectfully,

GEORGE BROWNELL.

NEWTON, FEB. 25, 1843.

DEAR SIR — You may remember, that we did not weigh the Arkansas (the Winans Engine), which, in order to a perfectly accurate Table, such as you requested of me, should have been done. It may be presumed, however, with a good degree of certainty, that the weight of these Engines are the same. If so, another of them, the Illinois, having been weighed by Messrs. Barnes and Gray, last August, three different times, affords sufficient data for determining the weight of the one we used last in our experiments. The three weighings were as follows:

	45,812 lbs.
	45,450
	45,350
	3)136,612
Average of the three weighings,	45,534 lbs.

One sixth part of this weight is considered the measure of her adhesive power; though it is not probable, that any engine, on any of our roads, is loaded once in a hundred times beyond that point, which calls into requisition an adhesion equal to more than one-seventh of her weight on drivers.

On a good level road, eight pounds per ton is considered as sufficient for overcoming the friction caused by moving one ton; and the gravity on an inclination of 18 feet to the mile, requires eight pounds more, or 16 pounds per ton; on 36 feet to the mile, 24 pounds; 54 feet, 32; 66 feet, which was the grade at Springfield, 37. On an inclination of 72 feet, it would be 40; and on 83, which is the maximum grade of the Western Road, it would require a power equal to 45 pounds, suspended over a pulley to move up the grade one ton, of 2240 pounds.

There is a difference of opinion among engineers, as to the propriety of allowing for the friction of the engine. This is generally about 15 pounds per ton, which, on the Arkansas, would be equal to 307 pounds. The gravity or weight all agree to allow for. I have not usually considered the friction of the engine, and therefore do not consider it in the following table.

The whole weight as above, 45,534 lbs. $\div$ 6 = 7589 $\div$ 8 = 948 tons, which is her load on a level Rail Road. On an inclination of 18 feet to the mile, from 7589 pounds, I first take 8 pounds per ton for the weight of engine, say 20$\frac{1}{3}$ long tons, equal to 163 pounds, which deducted from 7589, leaves 7426,—this divided by 16, gives 464 tons, as her load up an inclination of 18 feet to the mile. If the inclination be 36 feet per mile, I have first to take 16 pounds per ton for the weight of the engine, and then divide the balance by

24, and proceed in the same way for any greater inclination, and from this process the following Table results:

On a level road, her load would be			948	tons.
On an inclination of	18	feet per mile,	464	"
"	36	"	303	"
"	54	"	222	"
"	66	"	189	"
"	72	"	173	"
"	83	"	152	"

By the first Table it will be seen that her load up the Springfield grade of 66 feet per mile ought to have been 189 tons of 2240 lbs. tender included, equal to 211½ tons of 2000 pounds. Her load was 205 tons; her speed 7.6 miles per hour, or 23½ minutes. The speed of the New York on the same grade, was about four miles per hour, or 38½ minutes. The latter was undoubtedly loaded to her extreme maximum power. In all probability it would have required 20, perhaps 30 tons, to have brought the Arkansas as near to her extreme or maximum power.

In the other trial of the Arkansas on the summit grade, her theoretical load, as above cast, is 152 tons of 2240 lbs., equal to 172 tons, of 2000 pounds. Her load was 148 tons 790 lbs.

And on the 11th of August last, the load of the Illinois, an engine of the same kind and class, was 189 tons, 1589 pounds, besides her tender, equal to nearly 120 tons of merchandise at a speed of more than eight miles per hour; a degree of speed which makes it highly probable, that she could have taken up 20 or 30 tons more, cars included.

And now, Sir, in view of this Table, and the law which certainly and absolutely governs and limits the power of a locomotive, you see the reasons why we chose these engines, *for our road.*

The Lowell engine weighs about 41,000 pounds, 24,000 of which only is upon the drivers; of course she can do nothing beyond (as you saw in her trial up the Springfield grade) what is due to an adhesion of 24,000 lbs. The remaining $8\frac{1}{2}$ tons is just so much addition to her load, and costs as much for its transportation as any other $8\frac{1}{2}$ tons, of each and all the loads they have carried over the mountain. And at the time of purchasing these engines, this was the fact, proportionably, with the engines of all other builders in the United States.

On rail roads of common inclinations, with only such an amount of business as brings all their loads below the maximum power of the engine, this feature was of comparatively trifling importance.

On the Lowell road, it would be but 36 pounds in 4000; while on the higher grades of the Western, it would be 383 pounds.

While from the West nearly all our trains are fully loaded, which of course makes a dead loss in every trip, of $8\frac{1}{2}$ tons. In this view, too, you see why the tender was made no larger. It is alleged, that we were cheated in these tenders, and it was testified, that the Lowell tanks held 1600 gallons, the Winans but 900; it turns out, however, that the latter hold 1140. This is enough, and more than enough to carry the largest load ever attempted from Chester factory to North Becket, unless something unusual occurs to detain them on the strong grade. This was so liable to happen on this difficult summit, that a halfway watering-place was provided for, before these engines were contracted for, and being there, it is worse than useless to take more into the Lowell engine, than the Winans tank will hold.

The extra weight of five tons, to the Lowell tenders, costs the same for transportation, as do any other five tons of her load.

It seems to be conceded by all, or nearly all the opponents of the Winans engines, that the purchasing committee were honest and careful enough in their examination of the sample engine, but suffered themselves to be deceived, "betrayed a great want of judgment."

You will perceive by their Report to the Board, at the time, that they rated the power of these engines at 80 tons of merchandise. No member of the Board expressed any dissatisfaction with regard to their reported capacity. Nothing equal to that had been known or hoped for, from any other engines; your experiments prove them to be 25 per cent. beyond this; and the one tried by myself last August, (the particulars of which are before your Committee,) show these to be more than 40 per cent. beyond what Mr. Derby, or any one else, had any right to suppose we expected.

Another fruitful topic of complaint is, that they are extravagantly expensive in the matter of repairs. You have called for and obtained the amount expended upon them, and have found that the cost per mile run with them is actually less than the average cost of all our other engines (small and large) in 1841. And in comparison with about twenty other roads, for the year 1842, (in a Table which you have before you,) it is seen that they are, in this respect, at least as economical as any other kind of engine.

I had no doubt at the time of purchasing, and have none now, but that, in the matter of repairs, they will prove cheaper than any other kind ever put upon any rail road.

Again, it is contended, that they are very extravagant consumers of wood. I regret exceedingly that you had no better opportunity of settling this matter by an experiment of your own, because *I know* that it would have resulted favorably to them. As it was, the Arkansas, with a load of 138 tons 790 lbs. from Springfield to Chester factories, consumed

two cords and seventy feet; and the Massachusetts with about 123 tons, consumed two cords and twenty-four feet, which shows that a cubic foot of wood, in the Arkansas, produced steam enough for carrying 849 pounds; and the same quantity in the Massachusetts, enough for carrying 867 pounds.

It should be considered, however, that the Massachusetts went forward, and in some instances encountered snow upon the rail, which presented a considerable amount of resistance and some detention. The Arkansas, of course, had the same detention with less resistance to herself from snow; but with more to her load, owing to her connecting rods, which threw the snow upon the rails, and produced considerable additional resistance under every car in her train.

In the trials last summer, the Lowell engine consumed rather less wood than the Winans; but in that instance the latter was detained at the depôts one hour and two minutes longer than the former, which in my judgment left them very nearly equal.

Respectfully, yours, &c.

WILLIAM JACKSON.

Mr. William Ward, *Chairman, &c.*

(L.)

Report on Treasury Department.

The Sub-Committee to examine the Treasurer's accounts and report, appointed on 28th January last, having attended their duty,

REPORT, that it was not in their power to give attention to the matter submitted to them before the 22d of February

last, by reason that the Treasurer's accounts could not be inspected with the vouchers, while the investigation of the Legislative Committee occupied the attention of his principal clerk, and that on this and two following days we made examination, but postponed verification, because two of the monthly accounts, the last of the year, had not come in so as to be audited by the Directors' Committee before the labors of the General Court began. We have examined the annual account of the Treasurer of the Western Railroad for the year ending 31st December, 1842, and also the accounts of the Albany and West Stockbridge Railroad from 1st June to 31st December, 1842, and find each of the same to be correctly vouched, and a trial balance produced, which is verified by us, and so we have appended our certificates to said accounts.

One or two points in the printed statement of the annual Report, p. 24, we thought might be misapprehended, and therefore, we obtained explanation. Expenses of transportation, therein represented in Treasurer's books at $371,-371.64, are in the original books at Springfield represented at $266,619.30, as on p. 33, table B. exhibited in heads, supplied by tables C. to H. inclusive. So $104,752.34 are to be diversely disposed in the books, here, as thus, the great charges $33,470.57 for hire of the Hudson road, p. 27, belongs to a different head from this, and the charge $27,694.89 for the damages in a former year, on same page, are no proper charge for this year. The large amount of $25,053.71 for materials, not used, being on hand, chargeable indeed to the department, but not to the year's expense, and several smaller items, truly chargeable to capital, make up the difference to our satisfaction, so that this head in the Treasurer's books must receive credit to the full amount by debits to other accounts.

Another item, on p. 24 is, "due from agent of transportation department $96,503.26," we asked and obtained explanation of in full, as in brief is given in the note on that place.

Of the number of shares, pledged to the corporation, presented on p. 25 as 2691 for the amount of $136,763.58, we made thorough inquiry. We are glad to find the debt reduced, since our printed report to the Legislature, to $115,331.02, and, that if we could be so happy as to look at this as one debt to us, instead of many, the 2612 shares remaining would be ample security. But as the amount paid on the shares by the several debtors varies from 5 dollars to 90 dollars per share, we have been compelled to justify the Treasurer's anticipation of loss to extent nearly of $19,000. The stockholder who has paid but 5, or 10, or 15 dollars per share, ought either to abandon to the corporation, as did the nominal holders of the 2797 shares, belonging already to us, or pay up. We can have no benefit from rise in value without; and we ought to be equally free from chance of loss. Such a stockholder will not complain that he is next year not allowed to vote, as his privilege for the last four or five years has been too cheaply purchased. These inert shares lie a block in the market, to prevent true value being got by any executor or other trustee on his sale under the law. We strongly recommend to the Directors, in the coming summer, to close such accommodation at an early day.

The financial operations have in the year past been brought nearly to a close, and a popular view may be taken in a minute. Nominal means of our great work have been from

Stockholders of 20,000 shares, total capital	$2,000,000
Commonwealth as stockholder, 10,000	1,000,000
Scrip of Commonwealth, represented at our re-	

quest in sterling money, £900,000, at $4,44.4	4,000,000
City of Albany scrip	1,000,000
	8,000,000

From these nominal means we have already received or are confident of as follows:

Massachusetts scrip, one hundred pounds sterling not yet issued)	$4,010,505.59
Albany bonds ($100,000 set aside at starting for sinking fund)	989,620.15
Massachusetts, our partner for $10,000 shares	1,000,000
Private stockholders	1,992,000
	7,992,125.74

Of the loss, or discount, we actually undergo, (besides that, contingent, upon the capital in the last line represented very nearly perfect of the 2797 shares owned absolutely by us, as resigned by original stockholders,) we must desire the stockholders to bear in mind, that the £ sterling is in Massachusetts currency, $4,44, but by our directors most properly ordered to be regarded, in their guarantee of principal and interest, as relates to holders in our country as $4,80, or 8 per cent. advance. Of course, what we have to pay in London depends on the rate of exchange at each semi-annual period of our remitting for interest, and at the period of taking up the scrip by payment of principal. The great sum of the discount, here or abroad, on this amount, perhaps equal to $309,000, is to be set against the advantage of our having created the road at all, for it could not have been built by any other means, it may be, for twenty years. As in all other human enjoyments, we must take the bitter with the sweet.

We fear a portion of this loss arose from too rapid action of our Directors on the very day of our special meeting. The fiscal operations of the Treasurer did, last summer, certainly render expedient sale of large parts of our scrip at the discount reckoned on a 5 per cent. stock to make it yield 6 to the buyer, because it was pledged for loans in various institutions. The Savings Bank had lent $700,000 on security of our scrip, and £168,500 was sold to that Institution in lieu of principal and interest of that debt. Similar operations, or the sale in December, for the same reason, were expedient. But on 20th December last the Treasurer states to the Board, that in his opinion he can now sell all the Massachusetts scrip, in obedience to the order of 29th June last, provided the whole remaining stock be sold; but that the corporation is, now, financially speaking, at comparative ease, and he asks the instruction of the Board on the expediency. So much of the order of 29th June, as made it obligatory upon the Treasurer to make sale of the scrip was suspended until the next meeting, by vote of two of the State's and two of the stockholders' Directors against three of the stockholders' Directors. Money, we all know, had become plenty, and was growing more so. It was unemployed in every bank. At the next meeting, 10th of January last, the Treasurer prayed instructions relative to disposing of our scrip, and one of the stockholders' Directors moved, that the Treasurer be directed to sell the whole of the Massachusetts scrip held by the corporation, provided he can sell it at a price equal to a 6 per cent. stock at par, and the motion prevailed by two more of the stockholders' and two of the State's Directors uniting with him against one of the stockholders' and two of the State's Directors in the negative.

Page 26 of the annual Report shows the amount unsold on 1st January, in dollars at $4,44 the £ sterling $821,333.33;

and if, as many men on the Exchange suppose, the change in the money market is equal to 5 per cent. in value of permanent stocks, we might have been more lucky, except on the stock held in London, partly sold, partly since sent back, (the former being £45,000) by $41,000, if the direction to the Treasurer had not passed. It was done for the best, and we would not refer to this most recent act of our Board, but to show all the stockholders, that an error may be fallen into by the most careful men, and is entitled to indulgence in speaking of it. The Treasurer, in so vast operations, must desire assistance of the Board; but desiring or not, he must obey directions.

By the printed annual Report enough about further outlay and means therefor is shown.

We make an approximate estimate of charges and income.

Interest on scrip	$216,000
Banker's commission for the London part	1,000
Albany bonds, interest	60,000
Massachusetts sinking fund	40,000
Albany "	10,000
	327,000
Last year's net income	$246,000
Diminution of expenses	15,000
Increase of passenger's income	33,000
" freight "	80,000
	374,000

Last year the income was short, of all charges, about 60,000 dollars.

Our Treasurer informs us, that before the relief in the money market, last year, he was required to give his individual liability for more than two millions of dollars on pa-

per of the corporation. The banks refused, without his name, to lend to the corporation. For this he neither asks nor would receive any compensation; but he must rejoice more, even, than we do, at the termination, nearly attained, of such severe inflictions, by the completion of our great work. Respectfully submitted,

JAS. SAVAGE, *per order.*

Boston, 7th March, 1843.

Report of a Minority of the Committee.

The undersigned, a minority, cannot acquiesce in the conclusion of the majority of the *sub*-committee on the treasurer's account, that the vote of the directors, authorizing, by a majority of two to one, the sale of the State Scrip, at the rate of a six per cent. at par, may have been injudicious. The floating debt of the company was about a million of dollars when this vote was passed, the scrip had been unsalable at the price, and had realized even less in London. The United States were pressing several millions on the market at the same rate. The advance this scrip commands, may be ascribed, to some extent, to the relief of the market from the pressure of the sum unsold. In case of a future augmentation in the value of money, our company, requiring all its means, might have sustained a greater loss in a subsequent sale, and this sale principally to go out of this market, will secure a realization on our four hundred thousand dollars in Albany bonds, now on hand, on very favorable terms. At all events, the company was not in a situation to speculate on the changes of the market.

The undersigned is also informed by the treasurer, that before the sale was actually effected, all the directors were consulted, and made no objection.

He desires to furnish herewith a statement of the comparative results of sales of Mass. 5*s.* in London, by Messrs. Baring, Brothers & Co., in January last, and those made in Boston in accordance with a vote of directors on tenth of said month.

Extract from a Letter of Messrs. Baring, Brothers & Co., London, dated January 3d, 1843, to Hon. Josiah Quincy, Jr., Treasurer W. R. R.

We have pleasure to add that we have succeeded in placing a considerable amount of Massachusetts bonds, and that we have carried to the credit of the Corporation

£1100	90	990	
Less Commissions 1 per cent.,		9.18.0	
Brokerage, ½ per cent.,		2.15	12.13.0
			977.07.0
3d Jan. 1843.			
£40,000	Mass. 5*s.* 89	35,600	
Less Commissions, 1 per cent.,		356	
Brokerage, ½ per cent.,		100	456
			35,144.00.0
and we have sold a further amount, £3900, to be paid for 10 Jan. 1843,		3,900	
The Commissions and Brokerage will be		48.15	3,851,5.0
bearing interest from 1 Oct. £45,000 produced cash Jan. 4,			£39,972.12.0
On sales in London, the accrued interest is included in price. At the present rate of exchange in Dec. and Jan., say 6 per cent., allow for 60 days' bill, 1 per cent.,	7 per cent.,		2,798.01.7
			£42,770.13.7
	Cash 3d Jan., or		$190,091.78
A similar amount produced in Boston, sold as per vote of Directors,			
$45,000	at 417.20		187,740.00
Interest from 1st Oct. to Jan. 3d, on $187,740, 3 months 2 days, 6 per cent.,			2,878.68
			$190,618.68

P. T. HOMER.

Boston, March 8, 1843.

(M.)

The undersigned, a minority of the Committee of Investigation appointed by the stockholders of the Western Rail Road, beg leave respectfully to

REPORT:

That in being reluctantly compelled to dissent from the majority Report of their associates in some important points, they do not propose to weary your patience, or exhaust their own, in following after the able, but voluminous record of their worthy Chairman. He has chosen, as the theme of a considerable part of his Report, the farewell letter of a retiring director, addressed to the stockholders. This letter, however able in itself, or proper to be the subject of a report, has never, so far as the knowledge of your minority extends, been alluded to, or discussed, in any way, in any of the numerous committee meetings at which you minority were present.

Dismissing, then, this letter, your minority will state what they believe to have been the wishes of the stockholders in clothing them with the plenary, but disagreeable power, of an Investigating Committee. They supposed that they were to examine, so far as they could, the expenditures of the *past*, in the administration of this road, and to report, in relation to the *future*, what course should be pursued, if they should discover traces of a neglect of the best interests of the Corporators, or of a wasteful extravagance upon the part of any or all of the officers of the road.

It was not expected that any flagrant proofs of extravagance, or neglect of our interests, if any, would be detected, because no one doubted the integrity of our chief executive officer, or his desire, to the extent of his abilities, (whatever might be their measure) to promote the best interests of the

stockholders; and the minority wish it to be distinctly understood, that, throughout all these investigations, not the *character and integrity*, but the *ability* of this officer, so far merely as it regards our pecuniary interests, was in question; was he or was he not, the best man for our pockets in an economical point of view — this was the naked question, and to this, uninfluenced by personal considerations, the minority have wished to confine themselves, considering this officer, if it were possible, purely as a mathematical quantity, or power, for which so much was paid, and of which so much was required.

Had it been the desire of your minority, they might have multiplied the detail of such isolated facts as these, paying extra prices for oil, and other matters connected with the disbursements of the road. But the minority preferred rather to consider the expenditure of some large sum of money, and if *here* they discovered a want of regard to the interests of the stockholders, they thought it would be neither an unfair, or unjust conclusion, that smaller matters would receive less consideration.

Mindful of the old adage, although not prepared to give implicit credit to it, "that what all the world says must be true," the prevalent rumors with regard to, and against, certain expensive engines, costing $80,000, derisively, but popularly called Crabs, early attracted the earnest and careful investigation of the Committee. As many of our Committee as could do so repaired to Springfield, and upon the 24th and 25th of January last, under an inquiry submitted in these terms, "Is there any evidence before this Committee showing a want of due care and intelligence in the acts of the Standing Committee on Moving Power in reference to the order passed 8th July 1841, to purchase Engines for the Company," examined Messrs. Bliss, Jackson, Lincoln, and Derby, Direc-

tors, and also, documentary evidence. Upon the results of this examination, the Committee first differed — the majority embraced their views by the passage of this vote, against the remonstrances of the minority: "Voted, that from the evidence submitted to the Committee of Examination, they are satisfied not only that all due care and intelligence were used by the Directors and the Committee on the Motive Power, in the purchase of Engines from Mr. Winans of Baltimore; but also that *unusual* caution was evinced by them in that transaction, in their examinations and inquiries previous to giving the order." To this vote was appended a majority Report addressed to the Stockholders, but as it was subsequently *withdrawn*, together with the vote, allusion is now only made to it, because it is convenient for the minority at this late hour, who also made a counter Report, especially as they have since, from more extended inquiries and examinations, found no reason to change the opinions therein expressed, to refer to this their counter Report:

"The first question submitted by the majority was, 'Whether the engines purchased of Mr. Winans were found to be efficient and useful machines?' The only way in which, as it seems to the minority, the majority have been able to get over this question is by postponing it to an indefinite future time; they tell you that they have no satisfactory data to go upon, that alterations have been, and still are making, and that no correct opinion can yet be formed as to what these engines will ultimately accomplish. It is possible that this may be so; but the records show that the first engine was put upon the road, January 1st, 1842; the second, January 26th, 1842; the third, February 15th, 1842, — being more than thirteen, twelve, and eleven months ago respectively, possibly too these periods of time, averaging twelve months, may be far too short to allow ample time for alterations, improvements, and

repairs. If so, the minority have yet to learn the fact. They confess they have indulged the supposition, that, if there was anything to be said in their favor, after so long a trial, those who are their apologists, and some of them their buyers, would have pointed out their prominent virtues. But so far, the minority with regret are constrained to say that they have only heard of their defects, which may be briefly stated as these: great cost of repairs and alterations, admitted expensiveness of manual labor and fuel over other engines, great uncertainty as to keeping time, (an all-important consideration upon single track railroads, when the liability to fatal accidents by collision is considered,) and finally, great uncertainty as to the work they will accomplish."

"To sustain these views, the minority have learned from the machinists, at Springfield, that 1st. these engines will not, without important alterations, perform well, either with wood or coal as fuel; 2d. some of our bridges are too low to enable smoke stacks to be made sufficiently long for a successful exhaust of atmosphere to keep the fire efficient for steaming up. 3d. the vertical boilers are subject to leakage, and will extinguish the fire, if great heat is not applied to keep the metal in a state of expansion. 4th. the boiler tubes are too short, and the water tanks in the tenders too small to hold the requisite quantity of water to conduct them from one station to another; and being upon four wheels, instead of eight, as the Lowell are, they cannot be enlarged to answer a good purpose. 5th. the axles have been too weak, and not unfrequently breaking and damaging the cog wheels, as a great quantity of broken ones will abundantly testify. That they may, with considerable expense, be made in some degree useful, as a *reserve power*, and for dragging heavy loads upon the high grades of the road, the minority freely admit; but this they submit can, in no proper sense, be considered as

"answering the purpose for which they were purchased," or as being "useful and efficient machines."

Subsequently to this, repeated examinations, in committee of the whole, were held in Boston, at which the principal officers of the road, necessarily, from daily experience of the working of these engines, supposed to be best acquainted with their qualities and performances, were examined. At all these meetings the president demanded to be present, upon the ground that he himself was being tried. As the president had many able friends in our committee, and as the whole object of the minority was to arrive at all the facts in the case, they objected to his presence, upon the ground, that subordinate officers giving testimony before an officer who might, in their opinion, have power to influence their future condition, having, with the engineer, the power of removal, would of course embarrass them; this objection was overruled, and thus an able and acute lawyer was introduced into a committee, with the power, which a professional man will readily comprehend, by leading questions, of shaping and fashioning answers to meet his own views. We had no lawyer in our committee. Under such circumstances, the minority submit minutes, taken down at the time by one of the minority, and extracted from the officers examined.

Mr. Barnes, Chief Engineer, to queries, replies:

That leakage is common to all engines — more points of junction in a Winans engine, with six hundred and seventy-two tubes, than in the Lowell, with one hundred and thirty-eight — greater liability therefore to leak — if fire is allowed to get low will extinguish the fire — prefers horizontal tubes in a boiler — the Winans are vertical, about three feet long, and cannot be made longer — thinks it an objection — the heat is more economized by long boiler tubes, does not pass off so quick — the Lowell engine has tubes about nine feet in length

— tubes now made longer, in some cases doubling back — *chimneys* or smoke stacks too short — did not require so long a chimney with coal — fan taken off to burn wood — difficulty in burning, on account of being short — consume more *water* than the Lowell engine — *water* tanks too small, hold about eleven hundred gallons — large Lowell sixteen hundred gallons — new tender would cost about $2000 — would be better to build *new tanks*. He has not formed an opinion, because Mr. Winans has not yet told him that they are ready for trial — if in good repair, under existing circumstances, may be found to be useful in winter — if we had power enough, should prefer to keep them in *reserve* — not economical for us — require *two firemen* — extra pay to engineman fifty cents — engines ought to do more work — men did not like to do harder work, so could not be depended upon — delays from various causes connected with engines — at first was not favorably impressed — own opinion is, that they will never carry their adhesive weight — short of the Lowell engines in business done — four shafts broken — never a connecting rod broken on the Lowell — the Winans engines were not loaded to their capacity — they would start and be stopped, and could be loaded only to what they would carry — freight business was getting into great confusion, cars left behind, way-bills would go on, causing great dissatisfaction — gave orders to have twenty-five to twenty-six cars at Greenbush — twenty cars from Pittsfield as the load — do not carry equal to their theoretic capacity.

Mr. Gray, principal machinist, testifies — Bolts, nuts and screws soon loose since alterations — considers three of them perfect — one has been so say six weeks, one four, and one three — does not know of any alterations that Mr. Winans has suggested that have not been tried — in running vary from *eight* to *ten* hours — common result has been, could not

tell when they would get in — in better time of late — did not get along so well with wood as coal — in Springfield, a good part of the time, the engines have not been overtasked — have not carried as heavy loads as the Lowell engines — in loading, would give the Lowell *forty* cars, the *Winans* thirty cars — will not make *steam* enough to carry so large a load as the Lowell — *tenders too small* — do not work any better than they did — have got all they can do in the way of repairs as regards steam — bad name on the road — men kept out all night — Mr. Winans' men run them first — I would not run them in preference to the Lowell.

Mr. Eddy, eight years at Lowell, then at Springfield two years, of engines, says — Might have been out of order a number of times — off the road considerable, more than should be — off more than other roads — cost of fuel and repairs more costly than Lowell engines — thinks they burn extra fuel, and require extra oil, firemen and pay. All the alterations have been made that he knows have been suggested by Mr. Winans. Thinks the shafts are small. They have been run, since all the alterations have been made. The Illinois has been stated by Mr. Winans to be in perfect order.

Mr. Ross Winans, the builder and inventor of these engines, being present, stated "That he had great doubts, on the first attempt, whether he should make a perfect machine." In reply to a query, said, should not have objected to have it sent on, (that is, the Maryland) for us to try upon our road, *before buying it*, if at our expense. Recommends to alter all the bridges upon our road, by raising them *two feet higher*, thinks it it will not cost more than five or six thousand dollars. His smoke stacks three feet long — his engines lose at least twenty-five per cent. of their power, on account of *short stacks*.

A reference to the records will show, that there were many applications for the privilege of building engines for the Western Railroad.

Norris proposed to build twenty ton engines, for $7,800.
Baldwin, for . . . . . 8,000.
Locks and Canals, Lowell, ... 10,000.
Winans, ... 11,000.

The first named person, Mr. William Norris, of Philadelphia, offered, by letter, dated August 6, 1841, accompanied by highly respectable certificates as credentials, to build and deliver ten engines, by the 15th December, 1841; to place three of his engines, class D, in the hands of the Directors, as a pledge, to guarantee their performances, and also, that they should not cost over 3½ cents per mile, for repairs. If it were deemed necessary for the Western Railroad to travel so far south as Baltimore, in order to avoid the necessity of employing New England mechanics, inferior, as your minority believe, to none in the world, they can see no good reason why Mr. Norris's offer was not accepted, especially as the first cost of the seven engines would have been $22,400 less than the Winans, and as matters have turned out, their performances probably much more satisfactory.

The minority come now to the contract entered into by the Committee on Moving Power, Messrs. Howard, Bliss, Jackson, Lincoln and Whistler, with Ross Winans of Baltimore, for seven engines, at $11,000, $77,000, to which was to be added by agreement, one half of the expenses of transportation from Baltimore, making the engines cost, say $80,000. Mr. Winans had been for some years engaged in building ten ton locomotive engines, having four driving wheels, some of which had been in use upon the Port Deposit Railroad, and the Baltimore and Ohio Railroad, beyond Harper's Ferry. With the hope of obtaining a great

increase of power, at the same time that he threw a less amount of weight upon the driving wheels, an object very much to be desired, on account of the consequent reduced wear and tear of the rail, Mr. Winans, who is an exceedingly able and intelligent man, conceived the brilliant idea of *eight driving wheels;* and here the minority desire to record their belief, that he will ultimately succeed in perfecting this desirable result, and that they do not attach to him the slightest blame in regard to the seven engines purchased. If our Committee on Moving Power chose to saddle us with *seven experimental engines*, it was surely none of his affair. Mr. Winans built, as an *experiment*, a twenty ton engine, with eight driving wheels, a thing never before attempted with success, as your minority believe, in this or any other country. This engine, when completed, was placed upon the Baltimore and Ohio Railroad, for the purpose of testing its powers. And it was here that the Committee, who went on to Baltimore for the purpose, saw and tried this engine; it is true, that they returned the first time, without contracting, but they reported so favorably of this novel and comparatively untried engine, that they were sent on again, and ultimately, after a few more trials, the contract was made. The minority beg the stockholders to notice, that the large sum of $80,000, was thus hazarded upon an experimental engine of new construction — the first ever built of its kind — *not* ascertained to be complete in its parts, or harmonious in its action, liable, as all such complicated machines are, to latent defects, and, above all, never tried as it *might have been, and should have been, upon our own road.* The written contract itself, which the minority have the misfortune to consider as an exceedingly loose and ill-digested document, has this clause: "Payments during the progress of the work, to be made at the discretion of the engineer of the

Corporation, it being understood, that whenever any such payments are made, satisfactory security shall be given to the Western Railroad Corporation, by said Ross Winans."

Under this clause the minority found, upon inquiry, that $29,000 had been paid in advance, the security in Baltimore being a lien upon the engines themselves, and in Philadelphia, where part of them were built, the guarantee of an individual residing in New Jersey. When the $29,000 was paid in advance, the power was gone, the whip hand lost. After the first engine was received, for the Committee on Moving Power to go on, and shut their ears to any intruding doubts of their own, or others, which might begin to creep in, was then the grateful task — to have stopped, and taken no more, as was desired by one of the directors, Dr. Lowe, would have involved the disagreeable necessity of trying to get back an over-advance of $18,000.

"Returning were as tedious as go o'er."

Since the comparative failure of these Winans engines, it appears that the directors have ordered one fifteen ton engine from William Norris at $7,500, which is now performing to the entire satisfaction of the engineer; and also, that a twenty ton engine, from the same manufacturer, at $7,800, is soon expected to arrive, besides a sixteen ton engine from Messrs. Hinckley & Drury, at the same price. In the prospective state of our road, with insufficient motive power, great expenses may be anticipated in hurrying repairs. Our pay roll for the past year, showing, that in some instances *thirty-six days'* work has been paid for one man in a month upon engines, which can hardly be done to any effective purpose.

Of the past your minority may speak, they think, with some confidence; of the future it does not become them to place their opinions in opposition to scientific gentlemen, par-

ticularly while it is the pleasure of the public to believe, that there is something so very recondite and hidden in the working of a steam engine.

The minority will now touch upon a subject of vital importance to the interests of the stockholders — they allude to passenger fares. For what purpose, they would respectfully ask, did we, at vast expense, bridge rivers, cross ravines, disembowel hills and tunnel mountains, if it was not that we might at last tap the Great West — we accomplish the object, and at the very moment when nature steps in to our assistance, with her mighty arms of frost to arrest the great Hudson — we, through the majority of our directors, do what? *We put up the fares*, and thus, through their singular policy, defeat our own great object, and the first incentive to the undertaking of this costly enterprise. Much better judgment should we have deemed it to have *reversed* matters, and put the fare *six* dollars in summer and *five* in winter; because the traveller in summer, for mere pleasure, would not so much have regarded the difference as the small trader, or farmer, who in winter seeks our market for purchase or sale. But the undersigned are *satisfied*, from the most careful inquiry, that *four dollars the year through* would be the best point at which to fix the first class passenger fares; and in this opinion they are happy to believe that the majority concur, provided only that the Worcester Rail Road would unite with us in taking their pro rata share of the four dollars. We do not anticipate any insuperable difficulty in this. The minority forbear to press at length upon the consideration of intelligent stockholders the obvious truth, that just in proportion, as we can hold out to strangers and business men inducements to visit us, we shall increase our receipts, not only because *such persons must go back again*, but because also, they could hardly visit Boston, the heart of New

England, without carrying away with them some of those Yankee notions and manufactures, which are the basis of our prosperity, and which will also increase our *return freight to Albany* — a great desideratum, as the deficiency of upward freight, the past year, will show.

The minority trust they shall not be considered as travelling out of their path, or as presumptuous, if they state their belief, that the state of the times, both public and private, preach a large and practical economy to all men. It will be for the stockholders to determine, whether those men who have remained, for years past, the quiet recipients of large salaries, and who, perhaps, have had no practical cause to learn, that really the *standard of value has changed*, so that the silver dollar of to-day is more than the representative of the paper dollar of a few years past, can meet the exigency of the times and apply the actual cautery to themselves. In our view there is no use in disguising the matter. We stand between Scylla and Charybdis — Scylla ready to swallow us up, in the shape of large salaries and wasteful expenditures — Charybdis, the State, with expanded jaws, yawning to engulph the private stockholders. Our only safety is a sound and practical pilot. The Eastern Rail Road in one year cut off in salaries and expenditures, we are told, more than $40,000. This was done by a change of officers, and substituting practical men. We venture to recommend that all our salaries be cut down in the ratio at least of 25 per cent., upon the ground that $750 of to-day will go farther than would $1000 of three years back. If this be done in connection with that economy in all disbursements so familiar to all practical men, and so imperiously demanded by our present position, we, too, as a minority, from the mast-head may descry land, not indeed an "El Dorado," but our own rocky, iron-bound coast of New England, whose sons, if

Providence has granted them the power to conceive and undertake mighty enterprises like the Western Rail Road, may be assured, that He has also coupled with it, in his best wisdom, as a *condition* of success, the practice of those stern virtues of prudence, industry, economy, integrity, and adherence to principle, which first made us, through our fathers, the sons of New England.

We annex a careful synopsis, A, of the present financial position of the Road, and other tables marked B, and C, having reference to the Engines, all which is respectfully submitted.

ARTHUR PICKERING,
P. T. HOMER,
WM. THOMAS.

A

Synopsis of the Financial position of the Western Railroad, on March 1st, 1843.

ORIGINAL MEANS.

Massachusetts Sterling Bonds, payable in London, in 1868, 1869, 1870, 1871, at the rate of five per cent. per annum,	£899,000 00
The value of the £ sterling, reduced into legal decimal currency of the United States, $4 84½* cents,	$4,357,765.75
City of Albany bonds,	1,000,000.00
Subscription by the State of Massachusetts,	1,000,000.00
Subscription by individuals,	2,000,000.00
	$8,357,765.75

* The legal tender as fixed by recent act of Congress.

The above means *produced*, and are estimated to *produce*, as follows;		
Sale of Massachusetts Scrip,		$4,006,121.9
Estimated production of Albany Scrip (a large portion of which is already sold,)		991,000.00
Cash received from the State for 10,000 shares (her subscription,)		1,000,000.00
On individual subscriptions, and assets paid on stock relinquished to this Corporation,		1,638,633.00
Notes receivable for assessments (stock pledged as collateral,)	$115,000	
Less, considered without value,	18,000	
		97.000.00
		$7,732,754.93
Deduct amount set aside, and paid into the Albany sinking fund,	$100,000.00	
Do. Massachusetts sinking fund,	146,467.52	
		246,467.52
		$7,486,287.41
Add net income, from the time cars commenced to run, to January 1, 1843, (appropriated towards payment of construction,)		349,440.70
		$7,835,728.11

COST OF ROAD.

Expenditure to 1st January, 1843, as per annual report,	7,087,190 14
Interest paid on loans and scrip to 1st January, 1843, omitted in footing, do.	349,440 70
Amount expended and contracted for, unpaid 1st January,	311,746 66
Amount estimated to complete the road, } see annual report {	95,354 77
" engines, deemed indispensable, } see annual report {	72,500 00
Interest accrued on scrip and notes, in January and February, 1843, not paid, as per treasurer's memorandum,	42,819 12
Total,	7,959,051 39

IN RESERVE,

2797 shares of Stock belonging to Corporation, to be valued at the discretion of each stockholder.

SET APART.

Sinking funds, with interest, to 1st January, set apart for absorbing Albany and Massachusetts scrip, . .	$284,529 58

ANNUAL CHARGE ON THE ROAD, FOR INTEREST AND SINKING FUND, VIZ.:

Interest on Massachusetts scrip, . .	216,000	
Commissions to Baring, Brothers & Co., London,	1,000	
		217,000 00
Do. on Albany scrip, ...		60,000 00
Sinking fund, Massachusetts scrip, . . .		40,000 00
Do. do. Albany do.		10,000 00
Total,		$327,000 00

NOTE.—The receipts and ordinary expenditures on the road, for the months of January and February, as far as can be estimated, are supposed to be of about equivalent amounts.

(15)

PROCEEDINGS

OF

A PUBLIC MEETING

OF

THE INHABITANTS OF WORCESTER, Mas:
" Citizens-

AUGUST 28, 1847,

UPON THE SUBJECT OF THE

PASSENGER DEPOT

OF THE

WESTERN RAIL ROAD

IN WORCESTER.

WORCESTER:
PRINTED BY HENRY J. HOWLAND,
171 Main Street.

PUBLIC MEETING.

Pursuant to public notice, a meeting of the inhabitants of Worcester was held at the Town Hall, on the evening of the 28th Aug. 1847, to consider the subject of the present locality of the Passenger Depot of the Western Rail Road in this town, and the inconveniences to which the public are subjected by reason of the same.

The meeting was called to order by Hon. Levi Lincoln. Hon. John Davis was chosen Chairman, and Col. James Estabrook Clerk of the meeting.

The Committee who had been appointed at a previous meeting, to confer with the Directors of the Western Rail Road, upon the subject of their Depot, presented a Report which was read to the meeting.

Samuel M. Burnside, Esq. then offered the following Resolutions, which after a full discussion, in which Hon. Benj. F. Thomas, Hon. A. D. Foster, John M. Earle, Hon. Rejoice Newton and Hon. Levi Lincoln, took a part, were unanimously adopted, viz.

Resolved, That this meeting have listened with intense interest to the report of its Committee, just read; and while it tenders them its thanks for their laborious, faithful, and long protracted services in attempting to secure the great public objects of their appointment, it cannot withhold the expression of its surprise, and deep regret, at the unexpected result of their interview, and correspondnce with the Directors of the Western Rail Road.

Resolved, That the Western Rail Road is a work of vast importance to our whole community; that it was undertaken, carried on, and completed under the authority of the Legislature, who had regard to the growing wants, the multiplied interests, and the accommodation of the whole Commonwealth, and not exclusively, nor principally, to the pecuniary profits of individual stockholders; inasmuch as the Government has furnished in money, and by credit, five sevenths of the eight million dollars expended in its construction, without which aid, personal enterprise would not have accomplished it.

Resolved, That the citizens of every section of the state, bearing just proportions of the public burthen, have a right to ask earnestly, and in

the opinon of this meeting, a large majority of them *do* ask earnestly of the Directors, charged with the management of this expensive work, a just attention to their location, their business and convenience, without a too scrupulous calculation of expense, even if the desired improvements *should be attended, contrary to reasonable probability*, with some slight diminution of dividends which already exceed six per cent.; and some slight depression of stock, already more than ten per cent. above its par value;—an increase of profits for which the stockholders are altogether indebted to Government patronage.

Resolved, That the County of Worcester, in view of its wide spread territory, its great and expanding business, its rapidly increasing population, the constant necessity its people have for intercourse among themselves, and with residents in other Counties, and other States, at the Shire-town of the County, and of innumerable other considerations, have strong claims, which should not be longer neglected, for the accommodation prayed for in their petition, so unexpectedly rejected by the Directors of the Western Rail Road; and they will never cease to *urge their request*, on all proper occasions, until success shall reward their efforts.

Resolved, That the report of the Committee, together with the papers which accompany it, or such of them and such others as they may select, be published in pamphlet form, and distributed under their direction for public information.

JOHN DAVIS, *Chairman.*

JAMES ESTABROOK, *Clerk.*

REPORT.

The Committee who were selected at a public meeting of the Citizens of Worcester, to confer with the Directors of the Western Rail Road, relative to uniting the Passenger Depot or Station of that Company, in this town, with that of the Boston and Worcester Rail Road, have thought it due to their Constituents, that they should make a report of what they had done in the performance of the duty assigned them.

They therefore beg leave to submit a plain and simple statement of what has taken place in their endeavors to carry out the wishes of those whom they had the honor to represent.

Before proceeding to do this, however, it may not be inappropriate to recall very briefly, the circumstances which led to the appointment of this committee.

It will be recollected that about the year 1835, the Boston and Worcester Rail Road Company, purchased the land upon which their passenger Depot is situated. In making this purchase they were aided by the contributions of several individuals in the town, which were then regarded as liberal, and evinced a degree of public spirit which was fully appreciated by that Corporation. In the year 1833, the plan of constructing a Rail Road from the termination of that of the Boston and Worcester Company, westward, had been so far matured that an act of incorporation for the purpose was obtained. The nominal capital of the company, was fixed at a sum not exceeding $2,000,000, and efforts were soon after made to obtain subscriptions for the stock.

In the then stage of the history of Rail Roads, it is not surprising that the difficulties in the way of such a vast enterprise, should have seemed to be almost insurmountable. At length, however, in the year 1836, the aid of the Commonwealth was solicited, and the legislature having passed an act authorizing an increase of the Capital Stock of the Company, to $3,000,000, the State became a subscriber for one third part of the Capital.

When the Company were about to locate the eastern terminus of their road, so as to form a junction with the Boston and Worcester road it was thought desirable to establish it where it now is, instead of uniting it at the terminus of the latter Road. To accomplish this an application was made to the County Commissioners of this county, and a record of their proceedings in the premises forms a part of this report. This took place in 1837, and by granting that request the company were enabled to locate their passenger depot where it now is.

From information received by the committee, they are led to believe that had the Commissioners supposed the arrangement in reference to that depot was to be any thing more than temporary, they would not have granted the application of that company, and that, in that event, their depot could not have been lawfully established where it was.

The public felt, from the first, that a separate depot for the Western Road, from that of the Boston and Worcester road, was attended with inconvenience, but they knew how much that corporation was embarrassed in its operations, and having been led to believe that the arrangement was only for a season, they silently acquiesced in the measure.

Besides, for a considerable time after the road went into operation, its trains, by running over the Worcester road from the terminus of Western road to the Worcester depot, regularly, arrived at and departed from that depot. So that passengers were thereby accommodated, though at the expense of some little delay.

In the progress of events, even this accommodation was in a great measure withheld, whereby passengers coming from the west, who had occasion to stop at Worcester, were left at the depot of the Western road, nearly half a mile from Main Street, and were obliged to procure some private means of conveyance, to the points which they wished to reach.

Soon after the work upon the Western road had been commenced, if it had not been obvious from the beginning, it was known that the nominal capital of the Company, if it were all paid in, would be altogether inadequate to accomplish the undertaking. The public were accordingly appealed to through the press, through popular meetings and the legislature. It was placed upon the ground of a great State enterprise in which all its citizens were interested, while the idea of its becoming to the then holders of its Stock, a source of profit, was entertained, it is believed, by no one.

The public were, in effect, given to understand that unless the State put forth her hand in aid of the work it must stop. The appeal was successful, and by three successive loans of her credit to the company, in 1838—1839 and 1841, she aided it to the extent of $4,000,000, besides the $1000,000, which she had already subscribed towards the capital stock of the Company.

A loan besides these, was negotiated by the Company, for $1,000,000, with the City of Albany, so that the work was at length completed at a cost of about $8,000,000, only $2,000,000 of which had been contributed by private stockholders, exclusive of the State.

It was in this condition of things that it was recently stated and understood, that measures were proposed to be taken by which there was to be a common Depot constructed for the several Rail Roads that centre in Worcester, and that, in order to carry out the plan, it was necessary to make several important changes in some of the streets, which would require the action and assent of the town. A meeting was thereupon called, and by an almost unanimous vote of the citizens of the town, whatever was deemed necessary on their part to accomplish the work, was at once granted.

This meeting was held in December last, but after the lapse of a few

months, it was understood that so far as the Western Road was concerned, the scheme of uniting in one Depot was, for some reason, suspended or abandoned.

Upon receiving this information, several citizens of Worcester, knowing the state of public sentiment upon the subject, prepared and forwarded to the Directors of that Road, the Petition, a copy of which forms a part of this Report.

The receipt of this Petition was duly acknowledged by the President of that Company, on the 18th of March. Some time having elapsed, and nothing further having been heard from the Directors, it was thought proper to call a public meeting of the citizens of this town, in order to have a full expression of their views upon the subject embraced in the Petition. On the 25th of March, a meeting was accordingly held, at which it was unanimously concluded that a Committee should be appointed to confer with the Directors of the Western Road, at the earliest opportunity which they should see fit to grant.

The Committee thereupon, through their chairman, addressed a note to the President of the Road on the 30th of March, a copy of which forms a part of this Report.

It was understood that the Directors were then prosecuting measures before the Legislature, then in session, for obtaining an Act to increase the capital stock of the Corporation, and it was hoped that their presence in Boston for that purpose, would enable them to hear the Committee at an early day. But though their letter duly reached the President, no answer was returned, except the allusion in the note of April 13th, which is annexed to this Report, till the Legislature was upon the eve of adjournment, and the Act for increasing the capital stock of the Western Road had become a law. Then, on the 26th of April, a letter from the President, fixing the time for meeting the Committee, was received, which also forms a part of this Report.

At the time fixed for the proposed meeting, six of the Committee only were able to attend. They found upon entering the Directors' room, the place appointed for the meeting, eight of that body, including the President, assembled. The Superintendent and Engineer of the Road was also present. One of the Directors immediately left the room, and was seen again by the Committee only as they met him in the ante room, when they were leaving at the close of the interview. Another of them also left at the same time, but returned before the hearing was closed.

The Clerk in the first place read the Petition which has already been mentioned. The Committee then enquired of the Directors in express terms, whether the location of their Passenger Depot in Worcester was an open question ? because they did not wish to take up time in discussing a matter which had already been settled.

It was explicitly stated in reply, that the Directors were ready to consider it as an open question, and to hear the views of the Committee, and those whom they represented, upon the subject, and to act upon it as a matter on which they had not formed a judgment.

Upon this assurance the Committee proceeded to present such facts and considerations as they believed were calculated to have proper weight

upon the minds of the Directors. These were listened to by them with great courtesy and apparent attention.

They urged, among other things, that the Western Road was in reality a great public work, built by the faith and credit of the State, in accomplishing which, two only out of seven millions had been advanced by private stockholders, and this was without an expectation, on their part, of any immediate return. That the Directors were the Trustees of a great public enterprize, and were therefore bound reasonably to regard the wants of the public in respect to it. That here was a case where a large portion of the public were seriously annoyed by the present arrangement as to their depot, and the want of that connexion which ought to exist between the trains upon this road and those upon the other roads, at this central point, and that all this might be easily obviated by an expenditure of a reasonable sum of money.

In order that the Directors might judge somewhat of the extent of the community who were subjected to embarrassment by the present arrangement of the Depot of the Western Road, the Committee exhibited to them statistics which had been derived from authentic sources, tending to show the amount of business which was done by the Western Road in connexion with their Depot at Worcester. They gave a list of the towns lying west of Worcester, within the County, whose business rendered it peculiarly desirable to have access to it as the shire town, by means of this road, the population of which towns, by the last census, exceeded 16,000. This list they append to this Report, and it will be found to include no part of the twelve or more thousand inhabitants of Worcester, who would be more or less directly affected by the proposed change.

They stated the amount of freight money collected at this point for merchandize, &c., transported upon the Western Road during one year, ending March 1, 1847, to be $67,436,82. Nine-tenths of this merchandize, it is believed, was on account of citizens of this town. This statement was made, not in reference to any removal of the Freight Depot, but as having a tendency to show how extensive the interests and relations of a community must be, whose business led to such an amount of expenditure in freights, and that the number of those who were to be affected by the facilities which the Western Road saw fit to grant or withhold, far exceeded what might, at first view, be thought to be a true estimate.

It also served to show how far the amount thus paid into the treasury of that road, warranted an expectation, in return, of a reasonable expenditure for the accommodation of those by whom it was paid.

It ought to be added, that this amount was exclusive of at least $1,800 paid here yearly to Thompson's Express, for the transportation of packages, &c., on the Western Road; so that the aggregate amount of freight bills paid at this point, was but a fraction less than $70,000, in a single year.

The amount of fares paid by passengers coming to and stopping at Worcester, by the Western Road, during the year 1846, was $25,480,71, and by those going from the same point, westward, during that year, was $26,911,47—making an aggregate of money paid by passengers, to and from this point, $52,392,18, in a single year.

The Directors were reminded that all those passengers who had occasion to stop at Worcester for the transaction of business there, or to take passage by the other Railroads now in operation or in progress of construction, were, and would be, by the present arrangement of the Depot, subjected to unnecessary delays, and expense, and to various annoyances, which had led already to so much dissatisfaction, that, to the certain knowledge of some of the Committee, many gentlemen, from towns in the County, who would be glad to avail themselves of this road, as a means of access to Worcester, chose rather to incur the trouble and expense of procuring a private conveyance, than to submit to the inconveniences to which they would be subjected under the present arrangement of the Depots.

The Directors were reminded that it was not possible for passengers to hire themselves transported from the Depot of the Boston, Norwich, Nashua and Providence Roads, to the Western Depot, without incurring additional expense, and being subjected to the hazard of the loss of baggage, and often being prevented from regularly pursuing their journey, by the delay of a few minutes in passing from one Depot to the other; that the amount of these inconveniences would be constantly increasing, as the lines of Rail Roads connected with the roads now in use were multiplied, and to shew that they were multiplying, they referred to the "Stony Brook" road, so called, which is to connect the city of Lowell and the Roads that centre there with the Nashua Road at Groton, and to the Barre and South Gardner Road, connecting the Vermont and Massachusetts Road with the various roads at Worcester.

The Committee further urged that, if any change in respect to the Depots was to be made to meet the wants of the public, the present seemed to be the most favorable, if not the only time, at which to have it done, since the Boston and Worcester Company were about to construct a Depot in reference to their own accommodation, and that of the other roads centering here, and were willing and desirous of making provision thereby for the satisfactory accommodation of the Western Road, upon as favorable terms as the same could be done.

And in respect to the ability of the Western Road to meet any expenditure that might be occasioned by the proposed change, and the reasonableness of such an appropriation, the Committee reminded the Directors of the fact, that when the Commonwealth was called on for a loan of its credit, in 1838, the future probable business of the entire road, was estimated at an amount not exceeding $400,000 annually, of which passengers were to constitute $300,000, and freight $100,000, and that even that estimate was considered large, if not exaggerated. Yet that for the accommodation of that amount of business alone, the State assumed the risk and charge of $5,000,000.—That, as already stated, the actual amount of business of the Road, at this point, was, in passengers more than one sixth of what had been originally estimated for the entire road, and, in freight, was considerably more than two thirds of the amount estimated for the whole line of road, and that the aggregate of these, the last year, was more than one seventh of the entire business of the whole road in 1845, as stated by the Directors in their report of 1846.

With an annual income from the Road of a million of dollars, and its stock selling in market above par, the Committee thought that, applying the principle upon which the State had originally acted in reference to the accommodation of all its citizens, a portion of them who furnished, or were directly interested in such a large proportion of the whole business of the road, had a right to expect something like a corresponding regard to be paid to their wants and interests, by a Board who stand in the relation of trustees for the public, of a property, five sevenths of whose cost had been paid or furnished by the Commonwealth.

The Directors were also reminded of the circumstances under which their Depot was originally located where it now is, and the record of the proceedings of the County Commissioners already referred to, was read before them. They were reminded that the arrangement was originally understood to be a temporary one, which should be corrected as soon as the funds and general prosperity of the Road would justify the expense; that the people had quietly submitted to the inconvenience, under the belief that it would ere long be removed, and that now that the means of the Road were ample, and its dividends promised to be large, the public did think the time had come for their being relieved from these embarrassments, which could only be done by bringing the Passenger Depots of the various roads to a common point.

These, and various other facts and views, were urged upon the attention of the Directors, and were listened to with apparent interest and attention. None of these positions were then controverted, but, on the contrary, one or more of the Directors remarked, that the considerations thus presented were important, and some of them new. A somewhat free conversation was then had, on the part of the Directors, with each other, and with the Committee. They stated that it was their desire to accommodate the people in this part of the Commonwealth, as far as they could do so consistently with their duty to the Road, and to show how they had considered this matter, one of them read to the Committee a Report, which had been made to and accepted by the present Board, upon the subject of the Passenger Depot in Worcester. The Committee have not a copy of that Report, but they understood it expressly to admit that the Depot was not located in the proper place, if regard was had to the accommodation of the public, that the Depots of the Boston and Worcester and Western Roads, ought to be united here if it could be done at a reasonable expense, and that the great, if not the only material objection, to the proposed change, was the expense with which it would be attended, which the Report was understood to estimate at about $100,000.

If any other serious or important objections to the removal of their Depot, were embraced in that Report, they escaped the attention, or have escaped the recollection of the Committee.

To this suggestion of expense, the Committee stated that they were authorised to say, that the Boston and Worcester Road had nearly matured a plan for a Depot for the accommodation of their own, with the other roads, including the Western, and that "there was probability enough of a *very large* reduction of cost of providing it, from the former

estimate, to justify a careful enquiry on the part of the Western Rail Road Directors, if their decision should hang upon that question."

And the Committee further ventured to suggest that, even if the removal of their Depot should be attended with some additional expense, it could better be borne by so wealthy and able a Corporation, in the form of an annual rent, as was the manner by which it was proposed to be done, than by imposing upon individuals who might have occasion to make use of their road, the payment of an onerous and vexatious tax, in the form of extra charges and unavoidable embarrassments. And they expressed the confident belief, that the increased amount of business which would be brought to the road by the proposed change, would go far, if not to the full extent, of reimbursing to the Corporation any necessary outlays of moneys which they might thereby incur.

No formal action was taken by the Directors while the Committee were present, but there was an informal and repeated expression of opinion, on the part of individuals of the Board, that the matter was one which deserved grave consideration; that the Directors of the Boston and Worcester Road should be conferred with, in order to see what arrangement could be effected with that Road; that whatever could reasonably be done in the premises, by the Directors of the Western Road, should be done, and the subject of visiting Worcester by a part, or all the Directors, to ascertain more fully what could be accomplished there, to meet the public wants, was freely spoken of by more than one of the Board, in the presence of the others, and no objection apparently made to either of these propositions, by any of their number.

It was further stated by the Engineer of the Road, as the Committee understood him, that he himself was the first to suggest a union of Depots as a proper measure for the Western Road to take; and the President was also understood to state, that the measure had, from the time of its being first proposed, met with his approbation so far as its desirableness was concerned.

The meeting, on the whole, was of a most satisfactory character to the Committee. They received from the Directors, in all things, the attention and courtesy which they had a right to expect from gentlemen of their known intelligence and respectability, and they left the Directors with a confident belief that some measures would be taken, which would be satisfactory to all parties concerned.

It is hardly necessary, therefore, to say, that the Committee received the Report adopted by the Directors of the Western Rail Road, on the 14th of May, which forms a part of this Report, with surprise and regret. No communication had, in the mean time, been had by them with the Committee, or any other person in this vicinity, as they can hear, nor had the Directors, as the Committee are assured, had any formal communication with the Directors of the Boston and Worcester Rail Road, on the subject of their Report.

The Committee do not propose to comment, at length, upon either the premises or conclusions of the Directors in their Report. But they must say that, as they understand it, the Directors now place the denial of the prayer of the petition, upon other and in most respects altogether differ-

ent grounds from those taken in their former Report, or in their interview with the Committee. Consequently, much of that Report is now, for the first time, presented for the consideration of the Committee, nor have they before had an opportunity to examine or comment upon the facts and arguments that it contains.

It may, therefore, be proper for the Committee to say a word or two upon the positions assumed in that Report.

As to the probable cost spoken of, they can only say that, if the statement of the Agent of the Boston and Worcester Road is to be relied on, there is good reason to believe that the estimate of the Directors would be found considerably to exceed the actual expense of carrying into effect such an arrangement as would be satisfactory to the public.

Upon the matter of the second and third objections, the public have been aware that differences, at one time, existed between the Western and Boston and Worcester Roads, relative to the division of fares paid by persons travelling over both Roads. But the Committee are unable to appreciate the force of an objection to a great and admitted public benefit, growing out of a division of fares so minute as that which is contemplated in the Directors' Report. How far the Boston and Worcester Road would be willing to yield, or satisfactorily compromise, so trifling a matter, does not seem to have been thought worthy of the Directors' enquiry, though if the fact stated in their Report be true, that the Boston and Worcester Company are actually straightening an existing curve in their own road, and thereby shortening its length, it would seem that they would not be unwilling to waive the advantage of a little larger share of the "joint fare," if by so doing they could the better secure the convenience of the public.

However this might be, it is difficult to believe that the public will long be content to submit to be taxed and annoyed while using these Roads, in order to save to the one or the other, such a paltry advantage, in the division of their "joint fares," as seems to be contemplated with so much interest by the Directors in their Report.

In regard to the fourth and fifth grounds upon which the Directors base their Report, a brief explanation will show how far they are well sustained.

It is known to most who are interested in this question, that the track of the Western Rail Road, after leaving that of the Worcester Road, crosses the Norwich Road, so that the trains upon the Western and Norwich Roads pass over the same points of intersection. The distance passed over by the Norwich trains, between these points of intersection, is about 6972 feet, while that over which the Western trains pass, is about 5380 feet.

If therefore the trains upon the Western Road were to pass by the Depot of the Worcester and Norwich Roads instead of where they now do, they would have to run the distance of 1592 feet further than they now do. And by running over this additional distance of about 96 rods, every thing which the public desire in respect to the Depot might be accomplished.

Upon the question how far this might be done safely and without

unreasonable delay, the Committee would refer to one or two facts.

In the first place, the "Quick trains" between Boston and New York through Norwich, have passed daily over this curve for years, sometimes twice and sometimes four times a day, without any such hazard, trouble or delay as to occasion complaint in any quarter, to the knowledge of the Committee.

In the next place, as the whole distance between the crossing of the Norwich Road and the junction of the Western and Worcester Roads is but a trifle over a mile, if the whole of this were added to the distance run by the cars of the Western Road, it could only occasion a difference in time of less than seven minutes at the low rate of speed of twelve miles the hour. But when it is recollected that the additional distance to be run by the proposed change is in fact less than one third of a mile, it is difficult to understand upon what premises the Directors assume that the change would upon an average delay their trains *nearly fifteen minutes.*

Nor is it easy to see how they could have overlooked the delay to which their trains are subjected every day in crossing the Norwich and Providence Roads, in order to prevent the danger of collisions with the trains upon those Roads, which delay and danger would be at once obviated by adopting the change which is prayed for in the petition.

Besides these facts, the Committee are informed that as late as the year 1842, and with a full knowledge of all the facts as to distance, switches, curvature and delays now relied on by the Directors, a former Board endeavored to effect an arrangement with the Norwich Road whereby they should run their trains over this very curve, and by the Worcester and Norwich Depot, and were only prevented from accomplishing it by a difference of opinion between the corporations upon the price that one should pay to the other for certain privileges which were proposed to be conceded.

The desirableness and feasibility of the same arrangement, if it were not for the expense, were, as the Committee understand, not only conceded but sustained in the former report of the present Board, and neither the Engineer nor the President intimated, at the interview with the Committee, that a plan originating with them with a full knowledge of the facts, was liable to the objections which now stand forth so prominently in the Directors' report.

What new light has been shed upon the minds of the Directors since that interview, the committee have not been informed. It is earnestly to be hoped that in a matter of so much moment to the public, no differences which may have heretofore existed between the Boston and Worcester and the Western Roads as to "the division of joint fare," has been allowed to influence their judgment in granting or refusing the prayer of petitioners for a great public improvement.

It would be discourteous in the Committee to pronounce any of the positions of the Directors in this report as either frivolous or weak. But they must confess that they are unable to appreciate the validity of the doubt intimated by the Directors, "whether any advantages could be derived by having so many corporations meet in one common depot,"

even with all the circumstances attending it which are alluded to in this report in connexion with such doubt.

It is not the design of the Committee to criticise the report of the Directors, any farther than to say that to their minds its reasons and its conclusions are unsatisfactory and of little weight, in comparison with the great and growing inconveniences to which the public are and will be subjected so long as the present state of things shall continue to exist.

Although this report has already been so much extended, the Committee cannot conclude without repeating their unqualified regret that the Directors of a great public work like this, should have felt themselves called upon to refuse what was prayed for in that petition. It is a matter that concerns a large community. Not only the inhabitants of this growing town, but this whole county and thousands more remote, are directly interested in their decision of this question. It is not a small thing, in the aggregate, that those who may throng to this point by means of the other Rail Roads terminating here, in order to avail themselves of this Western Road, should needlessly be forced to submit to inconveniences and annoyance, and at the same time be subjected to the hazard of the loss of baggage, of detention upon the road, and of various other nameless discomforts which necessarily attend the present arrangement.

It does not seem to be just even to the stockholders of the other Roads that unite here. It will compel the public to seek other avenues of travel less liable to these objections. And the Committee greatly mistake the tone of public feeling, or there will at length grow up a state of irritation in the public mind which will be heard in a loud and decided remonstrance upon the subject.

The Committee are not unaware how powerless this community is to correct even the least of these evils by any direct action on their part.

The Commonwealth has given the control and management of this immense and powerful corporation into the hands of a body of nine men, and to their determination as to what accommodations the public shall enjoy, the public must submit.

To embarrass the action of this board is among the last things in which this community ought or would be willing to engage. In the rise, progress and signal success of the Western Rail Road, this community have always felt a just and generous interest. They have shown this at times when their influence was needed, and its exercise was felt and acknowledged. The time was when it was regarded problematical whether the construction of this road would not injuriously affect the growth and prosperity of this town. But her representatives, laying aside local considerations, were among the most willing to pledge the faith of the State to carry forward the work. To a great extent the same spirit has been uniformly evinced by the whole county, in the legislature and wherever else they have been called upon to act.

While, therefore, the Directors of that Road are willing to incur large outlays of expense in constructing new tracks, new branches and new Depots, to accommodate other portions of the Commonwealth, the people of this portion of it will be slow to believe that they alone are to be denied

a reasonable accommodation which can be furnished at a comparatively trifling expense. And this would seem to be the more unreasonable when it is recollected that the Directors of the Western Road, as is well understood, are proposing to expend large sums of money upon their present Depot in order to render its accommodations even reasonably comfortable for the public in the situation where it now is.

The Committee, in conclusion, are constrained by the course which the Directors have taken upon this petition, to believe that they do not understand the wants and wishes of this part of the Commonwealth. This may have arisen from the fact that no gentleman from this county has for some years been a member of that Board. Whatever may be the cause, it is far easier to suppose that they do not understand the public wants, than to believe that they would be willing capriciously to disregard them. The public, here, may therefore still cherish the hope that the Directors will yet give this subject the attention it deserves.

In drawing their attention to the subject, the example of the Boston and Worcester, and other Rail Roads here, can hardly fail to have an influence upon the Directors of the Western Road.

Although, with a single exception, these roads have been carried forward without any aid from the public treasury, their managers have in most things manifested a liberality and a just appreciation of the wants of the public that has gained for them the confidence and entitled them to the favorable regard of a whole community.

It is difficult, therefore, to believe that in the management of a great state work there can, for any length of time, be a spirit manifested which is less liberal or less magnanimous than that which directs the affairs of corporations which owe their success to private contributions alone.

With a renewed expression of the hope that the just and reasonable expectations of this community in respect to the matter which the Committee have had in charge, may ere long be met and answered, they respectfully submit this report, and ask to be discharged from the further consideration of the subject.

LEVI LINCOLN,
EMORY WASHBURN,
GEO. T. RICE,
GEO. BOWEN,
JOHN W. LINCOLN,
PLINY MERRICK,
CHARLES ALLEN,
STEPHEN SALISBURY,
ISAAC DAVIS,
JOHN DAVIS.

Worcester, August 5th, 1847.

APPENDIX.

PAPERS REFERRED TO IN THE BODY OF THE REPORT.

Commonwealth of Massachusetts.

WORCESTER, ss. At a meeting of the County Commissioners, begun and held at Worcester, within and for the county of Worcester, on the fourth Tuesday of March, being the twenty-eighth day of said month, and by adjournment, on the third Tuesday of May, being the sixteenth day of said month, in the year of our Lord one thousand eight hundred and thirty-seven. By John W. Lincoln, Esq. Chairman, William Crawford, Esq. County Commissioner, and Benjamin Davenport, Esq. Special Commissioner.

Whereas the Western Rail Road Corporation, by their agent, have represented, that by their act of incorporation, they are authorized to lay out and construct their Rail Road, *from the Western termination of the Boston and Worcester Rail Road*, to the Connecticut river, in the town of Springfield, &c.—That they consider it important to them and to the public, that their *Merchandize Depot, at least*, should be located in Worcester, at or near that of the said Boston and Worcester Rail Road Corporation, and they are desirous of laying out and constructing the Rail Road in as direct a line as is convenient, from the westerly part of Worcester, to the Merchandize Depot of the said Boston and Worcester Company, and of uniting the same, with the Road of said Company, at or near the said Depot, and fully had resolved so to do, and to commence the immediate construction thereof, and although the petitioners were fully convinced of their right so to locate their Road, under the provisions of their charter; yet they unexpectedly learn that a doubt upon the subject, has been recently suggested. Upon a question of so much importance to them, and to the public in its consequences, they are desirous of preventing any possible question in the premises. They therefore request the Commissioners, after notice, and hearing in the case, to authorize them, thus to locate their Rail Road, and to unite the same with the road of the Boston and Worcester Rail Road Corporation, as above specified.

Upon the petition aforesaid, the County Commissioners directed public

notice to all persons and corporations interested therein, that the said Commissioners would meet at the Court House, in said Worcester, on Tuesday, the sixteenth day of May, instant; at two of the clock, in the afternoon.

The County Commissioners having met at the time and place appointed, and having viewed the said route, and no person appearing to oppose the granting the prayer of the petition, it was considered and adjudged that the public interest required that the prayer of the petition should be granted, and the said Western Rail Road Corporation is hereby authorized to unite their said Rail Road with the Rail Road of the Boston and Worcester Rail Road Company, in the manner set forth in the said petition.

Ebenezer D. Ammidown, Esq. one of the County Commissioners, being absent, his place was supplied by Benjamin Davenport, Esq. one of the Special Commissioners, who was present, and acted in the view and adjudication aforesaid.

A copy of Record. Attest,

JOS. G. KENDALL, Clerk.

Note. In explanation of the Report, so far as it alludes to the foregoing proceedings, it is only necessary to state, that if the original act of incorporation of the Western Rail Road had been carried out, the termination of the Road would have been at or near the present passenger depot of the Worcester and Norwich Roads and where the common depot of the other roads, except that of the Western, is to be. The termination therefore of the Worcester, Norwich and Western Roads would in that case have been substantially at the same point.

The limited accommodations on that line for their Merchandize Depot, as is understood, led to the change prayed for in their application to the County Commissioners. The terminus of their road is now about 150 rods easterly from the passenger Depot of the Worcester Road. And in consequence of the County Commissioners authorizing this to be done, the Western Road were enabled to locate their passenger depot where it now is, instead of upon the line contemplated in their act of incorporation.

To the President and Directors of the Western Rail Road.

The memorial of the undersigned, citizens of the town of Worcester, expressing their own sentiments, and representing, as they believe, those of a great majority of the people of the town and county of Worcester, respectfully sets forth,

That they have learnt, with unspeakable disappointment and regret, the *refusal* of the Directors of the Western Rail Road to co-operate with the Directors of the Boston and Worcester, and other Rail Road Corporations, in the establishment of a common Passenger Depot, near the business centre of this town. In the judgment of the undersigned, the public convenience and interest eminently require such an arrangement. The

Shire of the largest county of the commonwealth, extending across its entire breadth, geographically bounded by three states:—the centre of a population of more than *one hundred thousand* inhabitants, nearly as large as that of some of the old States of the Union:—The concentrated point of communication, by numerous highways, with almost every part of the country:—A place of large capital, great enterprize, and of important moral and political influences and associations, would seem to be entitled, at least, to ordinary regard. While Depots are established, and even Branch Rail Roads are constructed, on claims of small comparative moment, *on other routes*, we find ourselves, with all our multiplied and varied concerns, subjected to constant and most annoying inconveniences. The whole travel *to* and *from* this town, by the Western Rail Road, under present arrangements, has to submit to *delay* and *expense* in passing *to* and *from* the cars. The train stopping on its way *east*, at the lower station, gives almost necessary occasion, especially to females, for the use of carriages to get up to town, either to be at their own homes, or for the purpose of meeting conveyances for other places;—And in going *west*, there is the same objection, with the added chances of uncertain and vexatious detention at the station house, to await the arrival of the train.

The extent of these inconveniences to those who have occasions of business in this town alone, to say nothing of the great numbers who come from the *North* to take the cars *Westward*, or from the *West* to go *North*, it is feared, has been *overlooked;* for we will not believe, if understood, it could have been so long and so utterly disregarded. Let it be recollected, that the courts, in this only shire of the county, are, at least, for three fourths of the year, in session, and *hundreds* of Jurors, and *thousands* of Witnesses, each year, are imperatively called *here*, in the course of the administration of justice;—that *here* are *all* the public offices, and the keeping of *all* the public Records,—the Registry of Deeds, to which almost every freeholder in the county has more or less occasion to resort, —the Probate Office, always open, with its courts of monthly appointment, where the widow and the orphan are often summoned to take note of proceedings, which concern their personal rights and dearest interests, —that *here* also, are *four Banks*, with more than an half million of capital; *three established Insurance Offices*, with numerous agencies of foreign similar corporations,—and that to all these institutions and places of business, of hourly recourse by multitudes of our fellow citizens, the distance, from half a mile to a mile, is interposed, by that will of the Directors, which dooms all, who come from the South parts of the county, to leave the cars at the Washington Square Depot. There is no relief from this grievance, now felt to be intolerable, but in a nearer communication, by the Rail Road, with the centre of the town. The Court House and the public offices *cannot* be removed. They are permanent structures of immense cost and recent construction, and in reference to the North and West parts of the county, and the convenience of the citizens generally, are in their proper location. If the interest of the Western Rail Road will not permit the arrangement of a transfer of its Passenger Depot, for

the accommodation of so large concerns, and so great a population, it may be hoped, it would not be too severely taxed by restoring the former partial alleviation of sending a car, from each train, to the junction with the trains of the other Rail Roads, at the upper-station. We might appeal, in aid of our wishes, to a remembrance of the exertions of the people of this county, in the establishment of the Road. It will be found, on recurrence to the Records of the Legislature, that our Senators and Representatives were among the earliest, the most steadfast, and most efficient advocates of the enterprize, and that, in no small measure, was it owing to the indefatigable efforts of some of the most able and distinguished of our citizens, in and out of the halls of legislation, that the credit of the government was lent to the work, without which, *to this day*, it had not been accomplished.

Believing, as we verily do, that the permanent and substantial interest of the Road, as well as accommodation of the public, will be greatly advanced by *uniting* the passenger stations of the several Rail Roads, which connect in this town, at one common centre, we earnestly ask a *reconsideration* of any determination relative thereto, or such arrangement, instead thereof, by your Board, as shall remove the inconveniences of which this large portion of the community now so justly complain. We make no appeal to popular opinion in this matter, although, we believe, that loud expressions of discontent cannot long be suppressed. Nor yet, have we sought any interposition from the Legislature, if any might be had, in our favor. As citizens of the commonwealth—proprietors, in part, of the stock of the road, in common with those in other districts of the state, and interested in whatever affects the general welfare, we feel that we may *confidingly* address ourselves to those, to whose foresight, prudence and judgment are intrusted the direction of this great public concern, submitting to their consideration, in plain terms, but with the most entire respect, the views which we entertain upon the subject.

Worcester, March 10, 1847.

Worcester, March 30, 1847.

A. Gilmore, Esq., President, &c.

Dear Sir,—Yours of the 18th instant, having been communicated to the citizens of this town, interested in the subject matter of the memorial, the receipt of which was acknowledged by you, they were led to hope that the proposed interview, with the Directors of the Western Rail Road, might have been had at an early date.

In order to prevent any delay on their part, the citizens held a public meeting, at which a committee was chosen, to meet the Directors of the Western Rail Road, and present the views and wishes of this community, upon the subject of the location of the Passenger Depot of that Road, in in this Town.

Messrs. Levi Lincoln, Emory Washburn, Charles Allen, Pliny Mer-

rick, John Davis, Isaac Davis, George T. Rice, Stephen Salisbury, George Bowen and John W. Lincoln, were the Committee chosen.

I am now desired in behalf of the Committee, to inform you of the action that has been had here upon the subject, and to say that the Committee will be happy to wait upon the Directors of the Western Rail Road, in order to present the views of this community upon the proposed location of their Depot here, and to express their desire that the Directors would select as early a period for the interview as their convenience will permit. Very Respectfully

Your Obt. Servant,

LEVI LINCOLN, *Chairman.*

Boston, April 26, 1847.

HON. LEVI LINCOLN, Chairman.

Dear Sir:—Your favor of 30th ulto. came duly to hand, notifying me that a Committee of the citizens of Worcester had been appointed "to meet the Directors of the Western Rail Road, upon the subject of the location of the Passenger Depot."

I would now respectfully notify you that a meeting of the Directors has been called for Friday next, at 10 1-2 o'clock, A. M., at the Treasurer's Office, State Street, where they will be happy to meet you and the other members of the Committee.

Very Respectfully—Your Obt. Servant,

ADDISON GILMORE, President W. R. R.

Number of population in the towns in the County of Worcester, whose access to Worcester, as the shire town of the County, would be accommodated by means of the Western Rail Road, according to the census of 1840.

Brookfield,	2472,
Charlton,	2117,
Leicester, say	853,
New Braintree,	752,
N. Brookfield,	1485,
Oakham, say	519,
Southbridge,	2031,
Sturbridge,	2005,
Spencer,	1604,
Warren,	1290,
Hardwick, say	894,
	16,022.

Boston, April 13, 1847.

JOHN W. LINCOLN, ESQ.

Dear Sir:—Your favor of yesterday is at hand, to which I reply—

First. That the number of passengers transported, during the year 1846, between Albany and the several way stations, to Worcester, were—

1st Class,	11,530,	amounting to	$17,445,83.
2d Class,	7,764,	"	8,034,88.
	19,294		$25,480,71.

Second. The number of passengers transported, in the same time, from Worcester to Albany, and all stations upon the Western Road, were—

1st Class,	13,780,	amount received,	$20,263,54.
2d Class,	7,080,	" "	6,647,93.
	20,860,		$26,911,47.

I shall call a meeting of the Directors at an early date, for the purpose of considering the memorial of several of the Worcester gentlemen, upon the subject of the location of a Passenger Depot. I shall notify Hon. Levi Lincoln of the time and place, when the Directors will be happy to meet you and the rest of your Committee.

Very Respectfully—Your Obt. Servant,

ADDISON GILMORE, President W. R. R.

Western Railroad Office, Directors' Meeting, May 14, 1847.

TO THE DIRECTORS.

Gentlemen:—The memorial of Hon. Levi Lincoln, and others, was presented to the Directors on the 30th ult., and referred to a Committee, with instructions to consider and report thereon, and they would now respectfully present the following Report.

That the Committee entered upon their duty with the hope and expectation that they would arrive at conclusions such as would enable them to report favorably to the granting of the request of the petitioners. They were aware that advantages would result from the change, inasmuch as it would better accommodate the citizens of Worcester, and those who have occasion to go to and from that place, and they were desirous of recommending such measures as would, if adopted, meet the wishes of so large a portion of the community, provided it could be done consistently with a just regard for the public good and their duty to the stockholders; but, on investigation, the Committee find objections to granting the request, which, to their minds, entirely outweigh any advantages in its favor—some of the most prominent of which are the following:

1st. The cost of carrying out the change would not fall much short of $100,000.

2d. It would lengthen the whole line of Road about three-eighths of a mile.

3d. It would shorten the Western Road about one-eighth of a mile, and lengthen the Boston and Worcester about four-eighths of a mile, which would be unfavorable to the Western Road, as the division of joint fare is always based upon the comparative length of the two roads.

4th. It would substitute a curve line of about 600 feet radius, for a portion of the way, instead of the present one, which is nearly straight; this objection, in the minds of the Committee, is one of great importance, perhaps paramount to any other. It is believed by your Committee that, if an improvement could be made in any other portion of the line, similar to that which the present line of the Western Railroad possesses over the one which would be substituted if the change of Depots should be made, that it would be done at a charge of from $50,000 to $100,000. They are confirmed in the opinion, from the fact that the Worcester Road, one of the oldest and most experienced, now have in contemplation straightening their road for a short distance, near the arsenal, to avoid a curve of 1140 feet radius, at an expense of about $25,000.

5th. The distance between the Western Road junction and the Worcester Railroad Depot, must, on account of the number of switches and the severe curve, always be more slow, and, even then, the trains would be more liable to accident than at other portions of the line; which obstruction, coupled with the additional length of line, it is thought, would delay the trains, upon an average, nearly fifteen minutes. This would be a serious objection to the quick trains, particularly such as may be running between Boston and New York; besides, it would be a great inconvenience to that portion of the travel which are joint with the Boston and Worcester Road, and that have no occasion for stopping at Worcester, which are large, compared with those going to and from Worcester, from the west.

In conclusion, the Committee deem it proper to notice one of the prominent reasons which has been urged in favor of making the change, viz: "That by establishing the Boston and Worcester, the Western, the Providence and Worcester, and the Norwich and Worcester Depots, in one building, common to all, it would better accommodate those who are desirous of changing from one line of road to the other." This would be a very natural conclusion, but whether it would prove so or not, is a question which may very fairly be doubted. There can be no doubt that, by locating the Depots near each other, it would be a convenience, but it is doubted by some, whether any advantages could be derived by having so many Corporations meet in one Depot, with the confusion and errors which would naturally occur under such an arrangement, over the advantages of a separate Depot on the present site of the Western Rail Road Depot.

However gratifying it might be for the Committee to recommend that

the request of the memorialists should be granted, they feel it to be their duty to report against its adoption.

Respectfully submitted.

(Signed.) ADDISON GILMORE,
JONATHAN CHAPMAN,
JAMES RUSSELL,
STEPHEN FAIRBANKS,
} Committee.

Directors' Meeting, May 14, 1847.

The Report was read and unanimously adopted, and a copy thereof ordered to be transmitted to the Petitioners.

ELLIS GRAY LORING, Clerk.







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